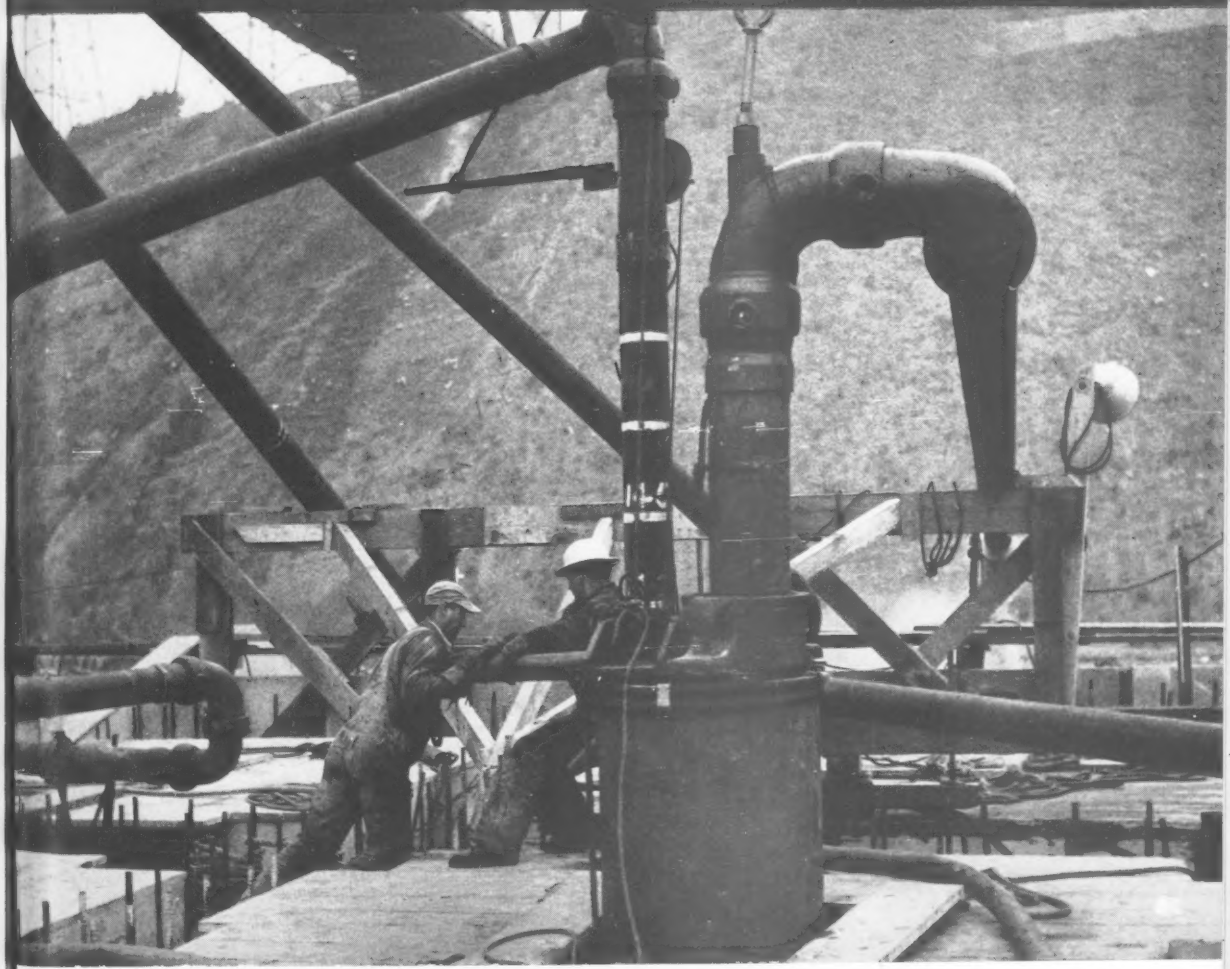
ENGINEERING NEWS-RECORD

- Making on-site prestressing pay off
- How one builder mass produces houses



Airlift sinks Carquinez Straits caisson p. 38

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Do you need a REALLY BIG ASPHALT PLANT?

...Big enough to handle both BIG and little jobs QUICKLY... with a WIDER MARGIN OF PROFIT?

Check the REALLY BIG features of the New STANDARD Model R-B 6000 lb. ASPHALT PLANT

REALLY BIG!
Not just a 6000 lb. mixer hung in a small plant—but a REALLY BIG plant throughout, with oversize screen, elevators and dryer, all teamed with the Standard Hi-Speed Pugmill.

RUGGED!
Massive pressed steel design, assuring STABILITY throughout the plant. (No H-beam columns used).

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HEAVIER shafts, LARGER bearings, THICKER alloy liner plates, BIGGER motors, combining to make a TOUGHER plant.

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No gadgets to get out of order! SIMPLE PUSH BUTTON CONTROLS permit any operator to produce AS HIGH AS 1800 TONS IN AN 8 HOUR DAY without fatigue.

ECONOMICAL!
All moving parts are reduced to the absolute minimum, assuring rock-bottom maintenance costs.

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IT'S BIG... but oh--SO PORTABLE!

STANDARD ASPHALT PLANTS . . built to do a better job!

STANDARD STEEL CORPORATION
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Attention Contractors!

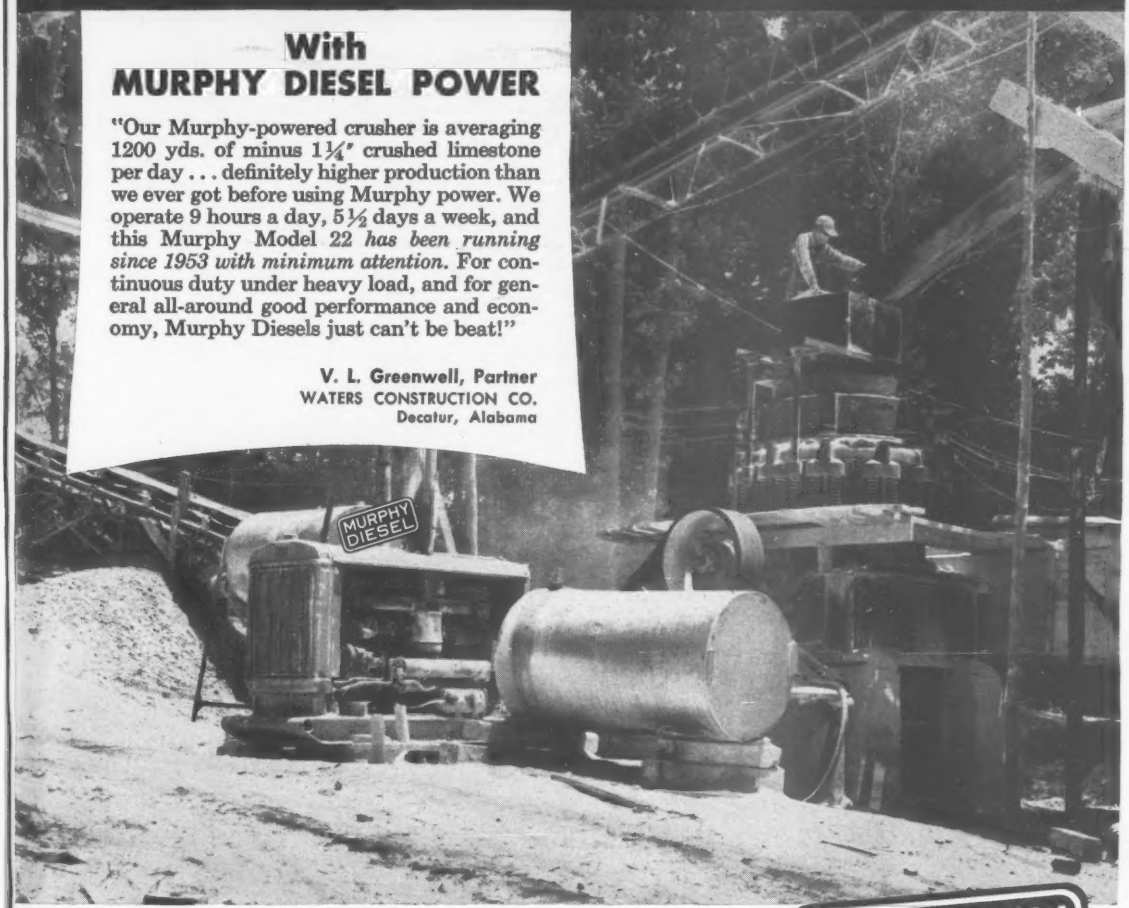
The New STANDARD Portable T. M. Plant offers top production. A *complete* self-contained batch type Asphalt Plant...on wheels. One man operates! Has exclusive "SELF-LIFT" erecting device. RUGGED – ECONOMICAL – SIMPLE. Mixes up to 60 to 80 tons per hour!

1/3 MORE PRODUCTION . . . 1/3 LESS MAINTENANCE . . . 1/4 LOWER FUEL COSTS

With MURPHY DIESEL POWER

"Our Murphy-powered crusher is averaging 1200 yds. of minus 1¼" crushed limestone per day . . . definitely higher production than we ever got before using Murphy power. We operate 9 hours a day, 5½ days a week, and this Murphy Model 22 *has been running since 1953 with minimum attention.* For continuous duty under heavy load, and for general all-around good performance and economy, Murphy Diesels just can't be beat!"

V. L. Greenwell, Partner
WATERS CONSTRUCTION CO.
Decatur, Alabama



When it comes to heavy-duty power for aggregate plants, shovels, draglines, generators, pumps, compressors, etc., Murphy Diesels are recognized throughout the construction industry for their dependability, long life, trouble-free service and economy that's unmatched by any other engine of comparable size. Why don't you put the many exclusive advantages of Murphy Diesel engines to work on your next job? Your Murphy Diesel Dealer can tell you how they'll make more money for you.

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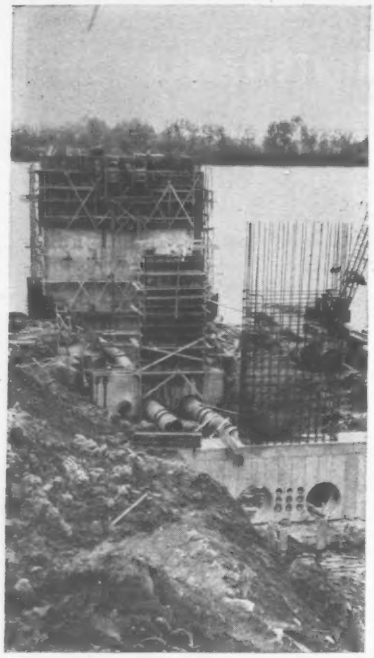
HEAVY-DUTY POWER for Construction

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generator units are available with capacities ranging from 64 to 165 K.W.

Symons FIELD REPORT...



Symons Forms used on Ohio River Intake Job...

60,000 square feet of concrete forming went into this job constructed for the city of Henderson, Kentucky. The wall started at elevation 317 (sea level elevation) or 21 feet below the river pool stage and when completed was topped at 385 or 47 feet above the water.

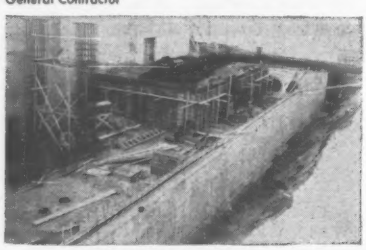
15,000 square feet of Standard Symons Wood Frame Forms were used, in sizes 2' x 4', 2' x 6' and 2' x 8'.

George Ryan, Vice President said, "Even in the eight foot lengths our Symons Forms are easily carried by one man. Another feature which we have found helpful is the ease of removing a panel at any place in a wall to clean keyways and straighten reinforcing steel. This has saved us a lot of time."

Three piers for an all access bridge to the intake structure were also formed with Symons Forms. Part of the project involved an extension of the Henderson power plant.

Symons Forms can be rented with purchase option, all rentals to apply on purchase price. Symons Clamp & Mfg. Co., 4265 Diversey Avenue, Dept. D-7, Chicago 39, Illinois.

Roy Ryan Sons Company, Inc., Evansville, Indiana
General Contractor



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No. 30 NORTHWEST

bound for WINSTON BROTHERS CO. Minneapolis, Minn.

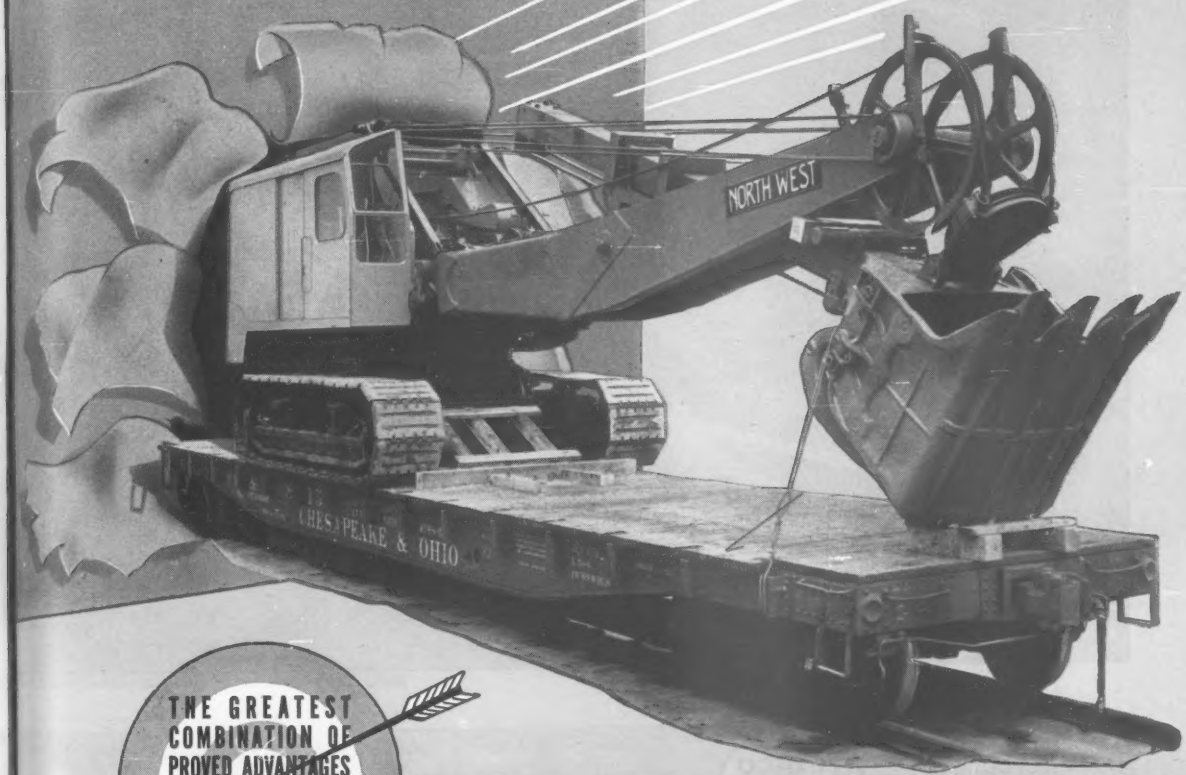
SOMETIME before 1927 Winston Brothers bought their first Northwest—the exact record is lost in limbo. That was 30 years ago. A few months ago the 30th Northwest for Winston Brothers rolled out of the Northwest plant. That makes an average of one Northwest a year over this long period of time.

Year after year both large and small contractors continue to buy Northwests—they continue to make one out of every three Northwests sold a repeat order.

Bear in mind this has been going on for years by contractors that day by day, month by month, become more successful just as has Winston Brothers.

More than anything else this demonstrates that Northwest leadership in design, quality and performance has been maintained *in advance of other* similar equipment.

NORTHWEST ENGINEERING COMPANY
1502 Field Building, 135 South LaSalle Street
Chicago 3, Illinois

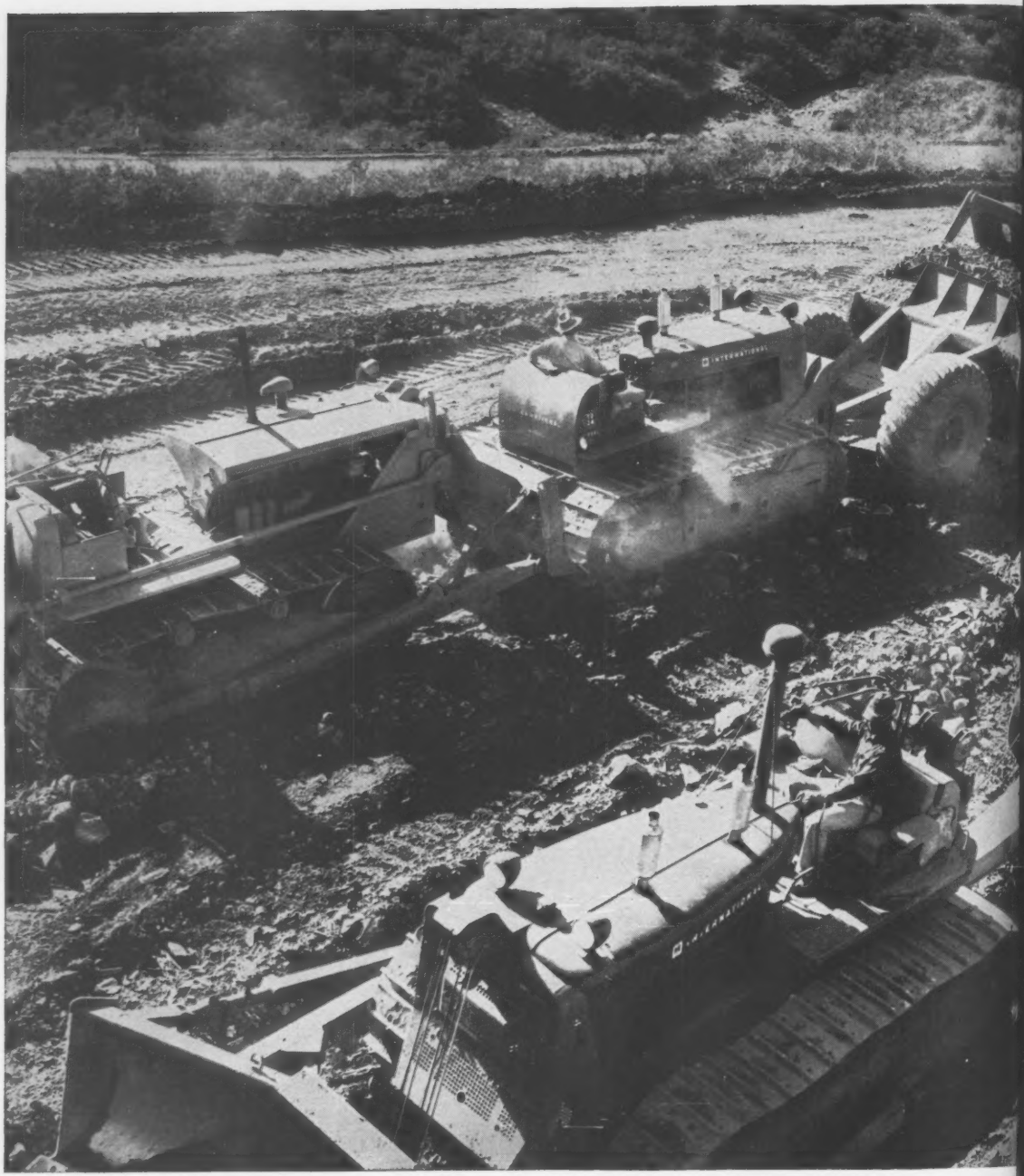


THE GREATEST COMBINATION OF PROVED ADVANTAGES EVER BUILT INTO A SHOVEL, CRANE, DRAGLINE OR PULLSHOVEL

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

How effective lu



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TEXACO

TEXACO

e lubrication keeps jobs on schedule

TO MEET JOB DEADLINES, your equipment must deliver consistently smooth, dependable performance. That calls for really effective lubrication — *Texaco*. And here are some names to remember:

Texaco Marfak for chassis lubrication. World-famous for its ability to *stay in* the bearings, even under heavy shock loads. Protects parts against wear and rust for hundreds of extra miles.

Texaco Marfak Heavy Duty 2 for wheel bearing lubrication. Seals itself in, seals out dirt and mud for longer bearing life, more miles between repackings, safer braking. No seasonal change needed.

MORE THAN 650 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD.

Texaco Universal Gear Lubricant EP for smoother-working transmissions and differentials . . . *Texaco Track Roll Lubricant* for low-cost protection of crawler mechanisms.

Texaco Simplified Lubrication Plan for an easy way to handle *all* major lubrication with *no more than six* Texaco Lubricants. You avoid errors, save time and money. Get full details from a Texaco Lubrication Engineer. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

NEW MULTI-PURPOSE MARFAK

Texaco Marfak Heavy Duty Special 2 is specially designed for *all* grease-lubricated bearings. This lithium-base lubricant pumps easily and lubricates effectively even at low temperatures. It resists water, has a long service life.

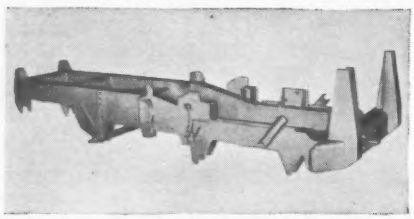
Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

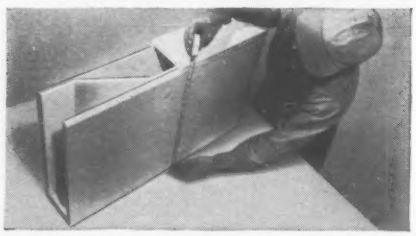
Now! an AUTOCAR

25-TON

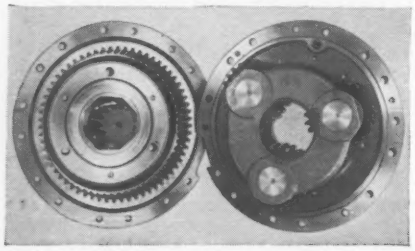
Announcing the Autocar AP-25 with box frame



The torque-resisting box frame



Cutaway view of frame showing corrugation



Hub end of rear axle, with view of planetary gears

This Autocar will open your eyes to what modern off-highway trucks can do. It hauls over 16 cu. yd. per trip. Its low-gear performance is phenomenal and in the higher gears it will do better than 30 mph under load! With the Autocar AP-25 you make every load a big one, every trip a fast one—by the end of the day you've really done a day's work.

HERE'S WHY THE AP-25 OUTPERFORMS OTHER COMPARABLE TRUCKS

A Mighty Engine

You have a choice of two rugged turbodiesels developing 335 and 375 hp. Maximum torque is 900 and 942 lb. ft.

A Planetary-Gear Rear Axle

The AP-25 is built to endure. The planetary-gear rear axle with final reduction at outer ends of rear wheels minimizes torque loads on differential and axle shafts, provides much longer gear and shaft life.

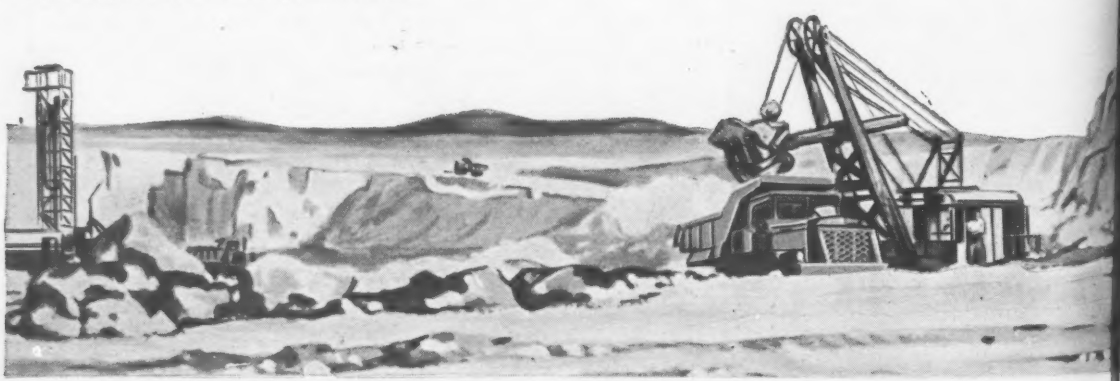
A Torque-Resisting Box Frame

This brand-new frame is designed to be the strongest and most rigid in off-highway operation. Of all-welded construction, it has a variable-depth box section (maximum depth 18½ in.), reinforced internally for its full length by a heavy corrugated plate which is plug welded to alternate sides at intervals of 15¼ in., and is also welded to the tension member. The whole frame is made out of ⅝ in. plate and

Autocar

AUTOCAR TRUCKS

Autocar Division of The White Motor Company • Exton, Pa.



for big, bruising PAYLOADS

and planetary-gear rear axle for tough hauling

weighs more than 7200 lb. It will resist the most severe torsional loading.

An Offset-Mounted Cab

The cab is specially designed for off-highway service. Ruggedly constructed of heavy gauge sheet metal, it is mounted in an offset position. The left half of the cab takes up the full depth, thus providing ample space for the driver, but the right half is cut back to allow the cab to be moved forward on the chassis. This position enables the wheelbase and overall length to be reduced by 11 in., and thus provide increased maneuverability. A 2-way adjustable steering column (2 in. range in height, 15° arc forward or backward), and "Full-Adjust" Driver's Seat allow the driver to select his most comfortable position.

Choice of Mechanical Transmission or Torque Converter

The mechanical (Road Ranger) type of transmission provides nine properly spaced speeds (all but one on a single gearshift lever). The wide range of gear ratios assures exceptional low-speed performance, as well as high maximum speeds. The optional torque converter and planetary-gear transmission permit the driver, while under full power and full load, to shift without changing the throttle setting. A Torqmatic brake and direct drive lockup clutch offer the ultimate in control, safety and brake lining life.

There are many other features to this massive new Autocar. For full information on what the Autocar AP-25 can do to lower operating costs and increase volume, contact your nearest White-Autocar distributor.

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His name is STANPAT, and though he is not human he can swallow up your tedious re-drawing and re-lettering of standard and repetitive blueprint items for 24 hours a day if need be—without tiring. STANPAT is the remarkable tri-acetate sheet that is pre-printed with your specification and revision boxes, standard symbols, sub-assemblies, components and cross-sections . . . with adhesive front or back, waiting to be pressed into position in 15 seconds! Reproductions are unusually crisp and clear, guaranteed not to wrinkle, dry out or come off. STANPAT saves hundreds of hours in drafting time and money, allowing the engineer more time for creative work.

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Reader Comment

Why Quit When It's Cold?

SIR—We at the Bureau of Reclamation read with interest your article on Canadian and U. S. winter concreting practices on the St. Lawrence Power Project (ENR Mar. 7, p. 23).

The Bureau permits concrete placement during cold weather provided the concrete is placed at a temperature of not less than 50 deg. F, is maintained at this temperature for not less than 72 hours after placing, and is protected from freezing for an additional 72 hours.

Many of our structures have been satisfactorily built during winter months. Builders of our large concrete dams, however, have chosen to shut down during the winter, apparently because they believe it more economical to do so than to provide facilities for winter placement and protection.

Recently the Bureau polled leading U. S. dam contractors requesting them to give their preference on the height of lift for large dams. A few preferred lifts as high as 10 ft, but the majority thought the lifts should be limited to 8 ft. It is desirable to eliminate cracks in the dam, and apart from construction preference, the height of a lift may be limited by length of block, climatic conditions, and whether or not artificial cooling is employed.

Recent Reclamation dams have been designed as arch dams, and in order to fully realize the benefit of arch action, the contraction joints between the blocks must be grouted when the concrete is at a relatively low temperature. To accomplish this during or immediately following the construction of the dam, it is necessary to artificially cool the concrete through embedded pipe systems. Placing of mass concrete in lifts of 5 ft in height has readily lent itself to such artificial cooling of the concrete through pipe coils embedded on the top of each lift of concrete. This can be accomplished effectively only in lifts up to 7½ ft high. Continuous placing of lifts higher than this would cause construction difficulties in placing the cooling coils at this spacing.

It is noted that the work described in your article "involves many relatively small and intricate pours and much concrete is very densely reinforced." The aggregate of the concrete for the Canadian job was limited to 3 in. maximum size with comparatively higher cement and sand contents than the lean low-slung concrete containing 6 in. maximum size aggregate which is customarily used in the placing of large unobstructed blocks in U. S. dam construction. Dry concrete containing aggregate graded up to 6 in. maximum size does not lend itself to handling by chutes and elephant trunks, as used by the Canadians for placing concrete in high lifts. In confined areas the Bureau requires the use of concrete containing an appropriate smaller maximum size aggregate. A concrete containing 6 in. maximum size aggregate and placed at a 2 in. slump will on the average require 85 lb less cement per cubic yard of concrete to produce a given strength than a concrete containing 3 in. maximum size aggregate and placed at a 4 in. slump. In a dam the size of Hungry Horse this additional cement would have $3 million. Apart from the savings in cement cost, it is desirable to have a low cement content in large blocks because of reduced temperature rise resulting from hydration of the cement.

We feel certain that our close contact with our northern neighbors on the St. Lawrence Seaway work will benefit us and I am equally certain that they will also be benefitted, and in time we will both adopt the best features of Canadian and United States practices. Your article will do much to bring this about.

L. N. McCLELLAN
Assistant Commissioner
and Chief Engineer
U. S. Bureau of Reclamation
Denver, Colo.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Wife Questions Salaries

SIR—In your recent editorial titled "A Gem From the Oratory" (ENR Mar. 21, p. 192) a quote by George S. Trimble, Jr.—"We are engineers because it is fun"—just about made my blood boil.

I wonder if I am the only wife who has listened to her husband say, "My son will never be an engineer." "Why did I spend four years in the best engineering school in the U. S. only to come out and after six years make less than a bricklayer?"

Engineers are supposed to be professional men, but I, for one, see no glory in being the wife of one who was on the dean's list through four years of

200 PIECES OF EQUIPMENT---TO BATTLE ROCK, MUCK AND EARTH---

ON 9-MILE STRETCH OF MASSACHUSETTS TURNPIKE!

CARVING OUT 800,000 YARDS OF ROCK—plus 5 million yards of earth—is taken in stride by Grandview Construction Corp. Their equipment "army" on the Massachusetts Turnpike includes over 50 rear and bottom dumps, 17 bulldozers, 18 compactors, 15 compressors, over a dozen shovels, draglines and cranes — and all sorts of special equipment. The tires used in this rocky cut are Goodyear's super-tough Hard Rock Lug.

THOROUGH MAINTENANCE A SECRET OF SUCCESS—This earth-moving monster has been overturned to simplify underside repairs. Tires are All-Weather Earthmover. Like all Goodyear tires, these are readily recappable—just contact your Goodyear dealer.

FAST-STEPPING OUTFITS END TUBE AND FLAP TROUBLES

with Goodyear 3-T Nylon Cord

TUBELESS TIRES!

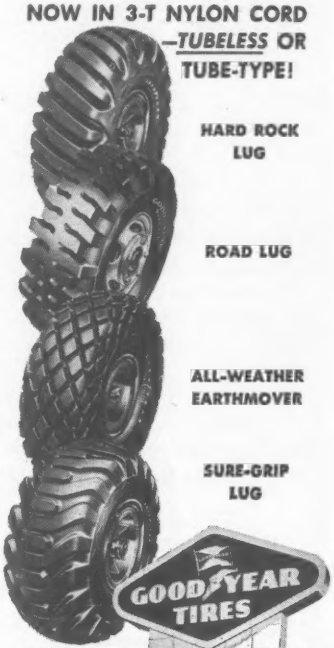
Ever consider what tube and flap troubles can cost in down time—plus cost of *replacing* tubes, long before tires are worn out?

And Goodyear TUBELESS tires save in many other ways! They run cooler—injuries are easy to detect—blowouts rarely occur—many repairs are simpler than ever before—construction and assembly are *airtight*—mounting of all sizes is quick and sure—and the simpler valve parts are re-usable!

Goodyear TUBELESS tires and rims are standard (or can be specified) on most sizes and types of new equipment—check your equipment manufacturer when purchasing. For moneysaving change-over of present equipment, simply contact a Goodyear dealer.

Goodyear, Truck Tire Dept., Akron 16, Ohio

NOW IN 3-T NYLON CORD —*TUBELESS* OR TUBE-TYPE!



Look for this nearby Goodyear dealer sign for better tire values—better tire care.

Buy and specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Road Lug, All-Weather, Sure-Grip—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

THIS AMSCO® LIP TAKES A SHARPER BITE

. . . chews out full loads at normal power

The lip juts way out where it easily bites up—and delivers—the full yardage of coal. It's a sharp *extension* of the dipper, with fanned teeth—for fast, easy penetration. The dipper digs out a heavier load without strain on the shovel . . . even requires less power, and prolongs life of all parts.

This Amsco lip lasts a long, long time, because it's made of the toughest steel known—manganese steel—the metal that work-hardens to fight off wear by impact and abrasion. Lip replacement is simple, when necessary, keeping downtime short.

If getting more pay loads moved faster with less wear on equipment means more profits to you, *specify Amsco Renewable Lip Dippers.*

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AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

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SUPERIOR BLADES

BEST for...

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Every JOB!

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320X

JAMES McHUGH Construction Co.—C. E. YOUNGDAHL & COMPANY
General Contractors
4445 SOUTH PARK AVENUE • CHICAGO 53, ILLINOIS

January 9, 1957

Georgia Pacific Plywood Company
270 Park Avenue
New York, New York

Gentlemen:

The Stateway Gardens Project consists of six 17-story and two 10-story apartment buildings. This calls for 1,200,000 sq. ft. reinforced concrete ceilings and 1,200,000 sq. ft. reinforced concrete walls, for which we plan on using 150,000 sq. ft. of GPX plastic coated concrete form plywood manufactured by the Georgia Pacific Plywood Company. The buildings, designed by Holabird & Root & Burgee, are unique, in that no columns or beams are used. The concrete walls constitute the supporting members.

Experience has proved to us that the many re-uses we get from GPX far exceeds what we might get with another form material. In addition, the smooth, uniform, concrete surface requires a minimum of painting and no further finishing. The concrete surfaces will be painted, thus eliminating a costly plaster job.

GPX thus affords us a considerable economic savings in addition to the many other advantages.

Very truly yours,

JAMES McHUGH CONSTRUCTION CO.-
C. E. YOUNGDAHL & COMPANY

D. W. Ransford

D. W. Ransford

DWR:mz

1 sq. ft. of GPX concrete form

covered every 17 sq. feet of surface concrete in Chicago's **$12,000,000**

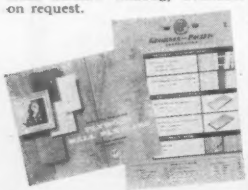
STATEWAY GARDENS

Between State Street and the New York Central Railroad, from 35th to 39th Streets, a city within a city is rising. Stateway Gardens, with its parks, apartments and schools, will bring a better way of living to hundreds of Chicago families. It is a story of architecture, engineering and concrete. Concrete poured, stripped and poured again in the same lightweight, plastic-surfaced plywood forms. GPX Concrete Form was reused here 17 times and the same handy panels will serve many future assignments, each resulting in smo-o-o-th concrete, requiring little or no finishing.

Unretouched closeup of wall shows concrete condition immediately after stripping away forms. GPX Concrete Form absorbs practically no water, strips easily.

Send for literature: GPX CONCRETE FORM

Booklets including 8-page section on specialty plywoods, reprinted from Sweet's Catalog, available on request.



GEORGIA—PACIFIC
CORPORATION

60 East 42nd Street, New York 17, N. Y. ENR 457
Please send me free literature on GPX Concrete Form.

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CITY_____ ZONE____ STATE_____

. . . Reader Comment

college and who racks his brains out for a company that probably doesn't even know he's there. Everyone will say in 15 or 20 years he'll make $10,000, but by that time he'll be dead. I for one agree with my husband: Engineers aren't recognized as professional men, they are just slaves who can't even afford two suits.

I read the ENGINEERING-NEWS RECORD to see if any other wives write in; maybe this letter will prompt them to do so. I hope you will print this, as this is America and freedom of speech still exists. May I also add, if engineers were paid as they should be, there would be no engineering shortage, and its about time they woke up and did something about it!

EDITOR'S NOTE — We have a rule against publishing letters anonymously. However, publishing the name signed to this one might not be the best way to assure that the lady's young husband's company be made aware of his presence. Anonymity, not requested, is imposed.

Fair with Fluoridation

SIR—We were gratified to find in ENR Mar. 14, p. 25, that at least one periodical has come out with a reasonably balanced, though somewhat short, report on the question of fluoridation.

ARTHUR C. FORD, *Commissioner*
New York City Department of Water Supply, Gas & Electricity

CALENDAR

Sanitary Engineering Conference on Solids Handling and Anaerobic Digestion, Manhattan College, New York City, Apr. 24-26.

International Commission on Irrigation and Drainage, 3rd Congress, Sheraton-Palace Hotel, San Francisco, Calif., April 29-May 4.

Building Officials Conference of America, Inc., 42nd Annual Convention, The Jung Hotel, New Orleans, La., May 6-9.

American Water Works Association annual conference, Atlantic City, N. J., May 12-17.

12th Purdue Industrial Waste Conference, Purdue Memorial Union Bldg., Lafayette, Ind., May 13-15.

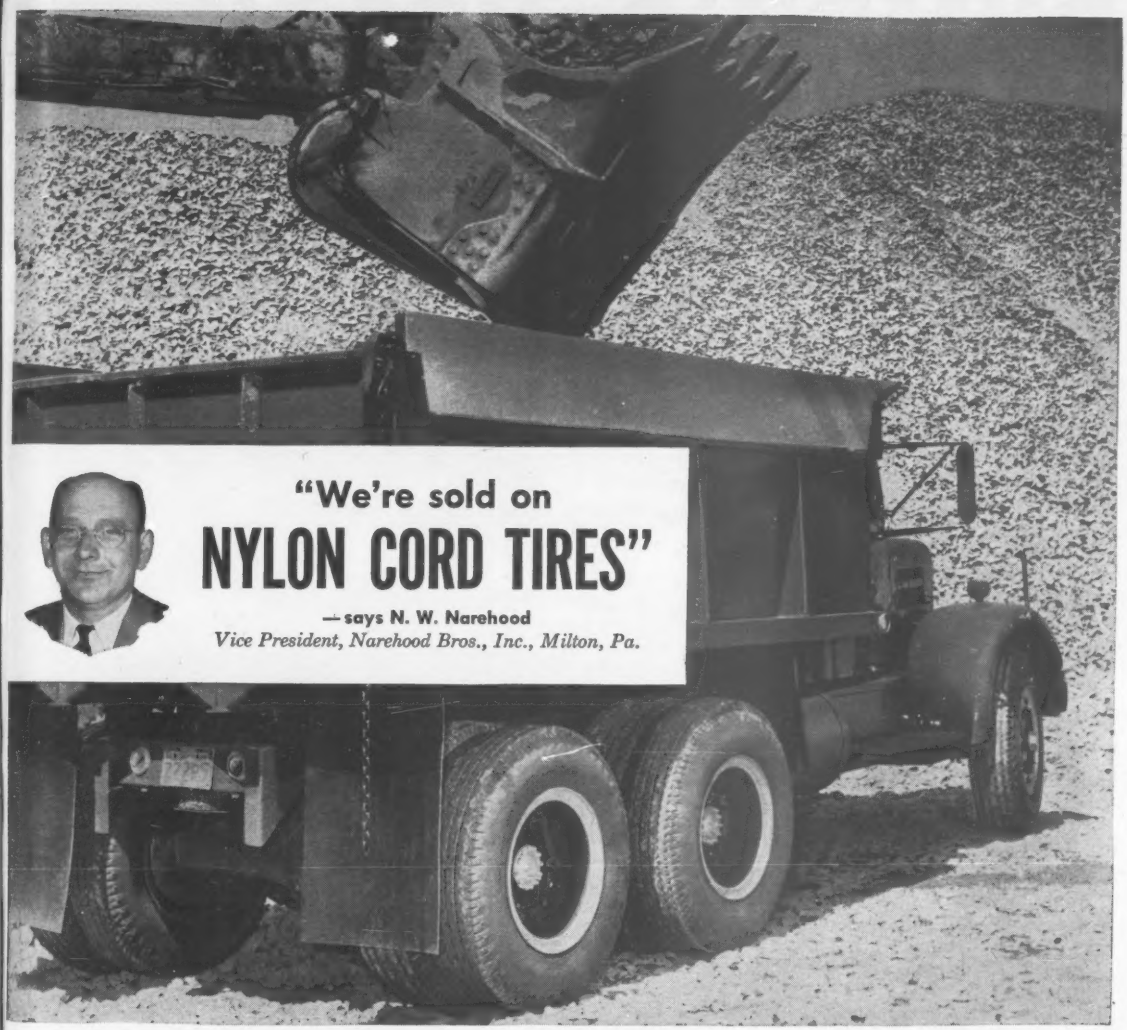
Society of American Military Engineers, annual meeting, Mayflower Hotel, Washington, D. C., May 20-21.

American Institute of Steel Construction, Ninth Annual Engineering Conference, Edgewater Beach Hotel, Chicago, Ill., May 27-28.

Air Pollution Control Association, golden jubilee meeting, St. Louis, Mo., June 2-6.

Annual Meeting of American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., June 16-21.

Concrete Reinforcing Steel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., June 24-29.



"We're sold on NYLON CORD TIRES"

—says N. W. Narehood

Vice President, Narehood Bros., Inc., Milton, Pa.

"We get longer wear, more retreads, fewer failures with nylon cord tires"

"Our road delays due to tire failures are down 90%. We used to have plenty of blowouts, particularly in hot weather. Now they're a rare thing!

"Six days a week, 12 hours a day, we move our 20-truck fleet over a 150-mile radius from the quarry to road-construction sites. The trucks roll over piles of blasted rock with 16-ton loads, yet some of our nylon cord tires have seen over 125,000 miles' service. We've found nylon cord tires have the extra strength to take day-in, day-out punishment and still give us good service after three retreads. You can see why our tire costs are down and why we've authorized total replacement with nylon cord tires for our fleet!"

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads, at the lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON FOR TIRE CORD

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

DU PONT
REG. U. S. PAT. OFF.

FOR TRUCKS AND PASSENGER CARS, TOO . . .
THE STRONGEST, SAFEST TIRES ARE MADE WITH NYLON CORD

PUMPING HEADlines

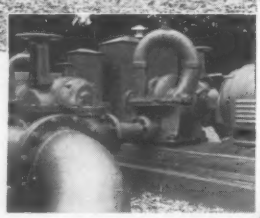
By Peerless Pumps

ON THE JOB FOR THE LARGEST MUNICIPALLY-OWNED UTILITY IN THE UNITED STATES—THE DEPARTMENT OF WATER & POWER OF THE CITY OF LOS ANGELES—PUMPING FROM RESERVOIR LINES INTO ELEVATED TANKS

510 FEET is the lift imposed on these 2-stage Peerless pumps. Two of the three 350 hp motor driven units can handle up to 6,000,000 gallons a day from inlet lines into an elevated storage tank of 2¼ million gallons capacity. The third unit, an engine driven pump, also rated at 350 hp, comes on in case of power failure and pressure demand. All three pumps are automatically controlled, starting and stopping being effected by pressure and flow controls. Pumps are designated as Peerless Type 8TU17.

View shows two motor driven 2-stage 2100 gpm pumps at the Beverly Glen pumping plant. Inset shows engine driven unit for standby service.

View shows outdoor all-weather installation of three motor driven 2-stage 1125 gpm pumps at Girard-Woodland pumping plant.



245 FEET is the head on these three Peerless 2-stage Type 5TU15 pumps. Like the units above, these pumps also handle water from a reservoir inlet line, lifting it into an elevated tank, in this case of 1 million gallon capacity. The three pumps have a capacity of up to 3,000,000 gallons a day.

For dependable, efficient pumping select and install versatile Peerless horizontal centrifugal pumps.

Mail the coupon below for illustrated and descriptive Bulletin.

PEERLESS PUMP DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION

301 WEST AVENUE 26, LOS ANGELES 31, CALIFORNIA

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☐ *Please send me Peerless Pump Bulletin No. B-1400*

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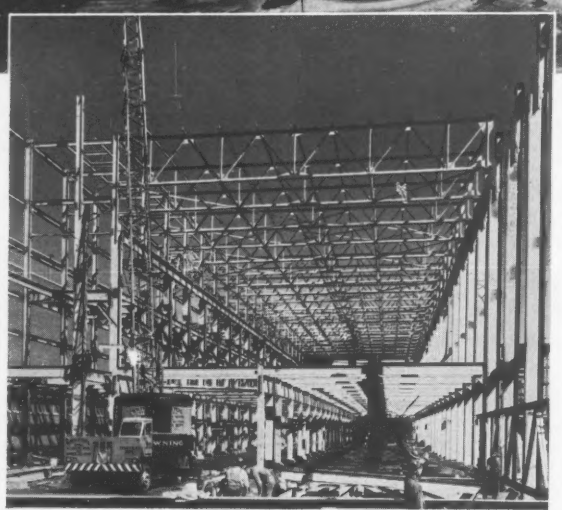
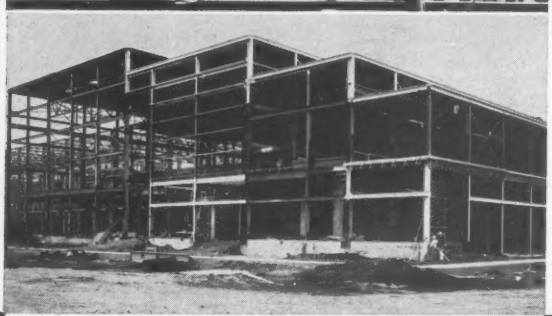
We built a toe-hold for a papermaking monster!





Another service to Southern industry by Bristol Steel!

With the start-up of the third newsprint machine this past January, Bowaters Southern Paper Corporation of Calhoun, Tenn., became one of the largest producers of newsprint in the U. S.

Bristol Steel fabricated and erected more than 3500 tons of structural steel for this expansion, designed by J. E. Sirrine Co., Greenville, S. C.

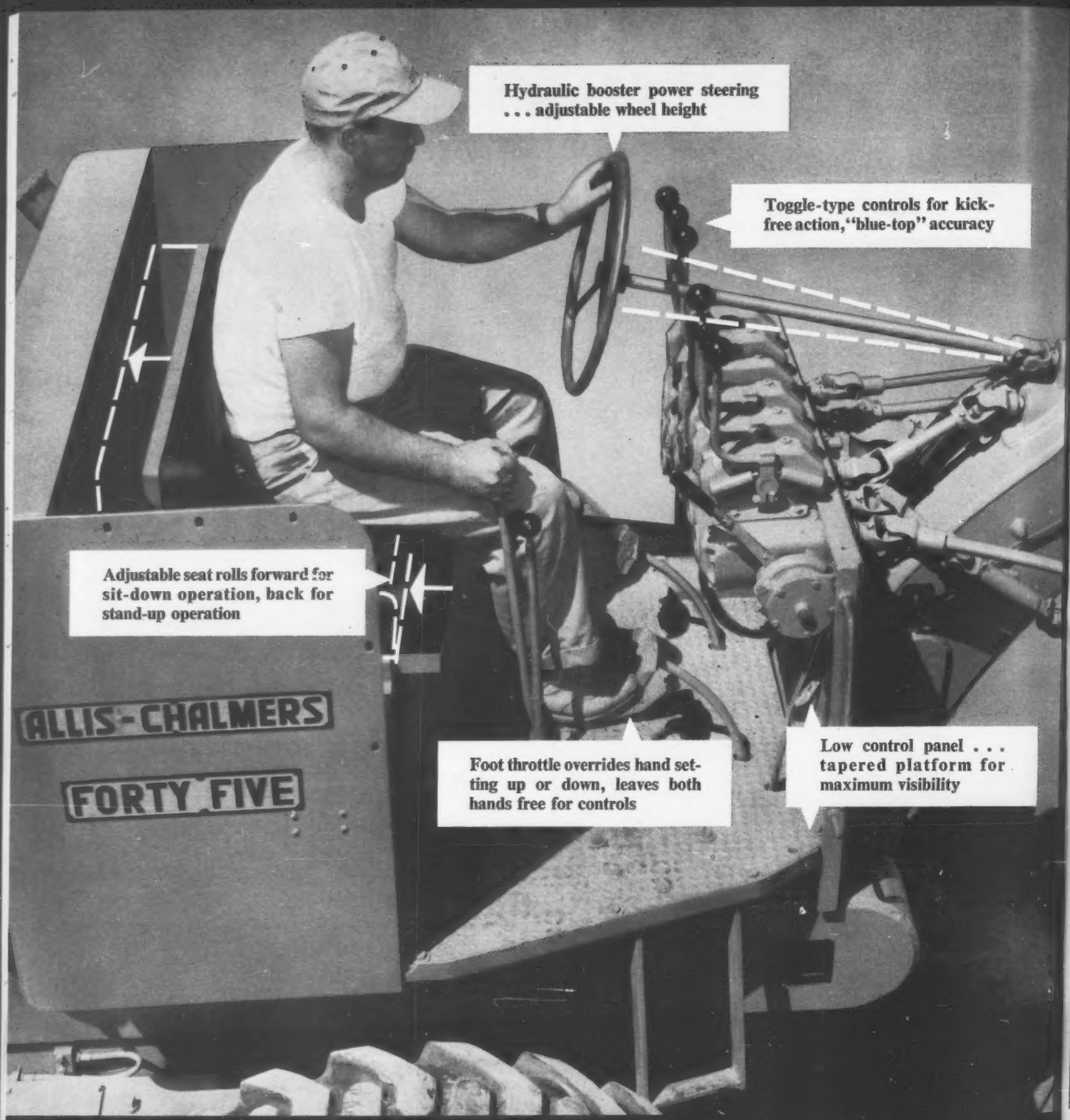
Our work on this expansion of the Bowaters plant is another example of Bristol Steel's contribution to the growth of industry in the South.

We invite your inquiries for fabricated structural steel requirements. Forty-nine years of experience and the facilities of two modern plants insure dependability to meet the highest standards.

Dependable Steel Service
Since 1908

AISC
AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC.
FOUNDED 1921

BRISTOL STEEL
AND IRON WORKS, Inc.
Bristol, Virginia


Hydraulic booster power steering . . . adjustable wheel height
Toggle-type controls for kick-free action, "blue-top" accuracy
Adjustable seat rolls forward for sit-down operation, back for stand-up operation
ALLIS-CHALMERS
FORTY FIVE
Foot throttle overrides hand setting up or down, leaves both hands free for controls
Low control panel . . . tapered platform for maximum visibility

FIVE WAYS YOU CAN BOOST GRADER PRODUCTION

. . . through operator comfort and control!

Features like these make satisfied operators . . . mean more production for you. They're yours in an Allis-Chalmers FORTY FIVE—120 brake hp, 23,800 lb. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

(*Advertisement*)

Sauerman News Briefs

SPECIAL EDITION OF SAUERMAN NEWS

Brief items about the Sauerman Method... Crescent DragScrapers Slackline and Tautline Cableways... Durolite Blocks

Sauerman Bros., Inc. • 632 South 28th Avenue • Bellwood, Illinois, (Chicago Suburb)

Waste Disposal Problem is Solved with a Tautline-Scraper

A Foote Mineral Company plant is using the Sauerman Method to solve a difficult sludge removal problem. A 2-yd. Tautline-DragScraper has proved to be ideal for the job. The sludge is handled safely and efficiently—men or machines need not travel on the material, since only the DragScraper and cables enter the disposal area.

The DragScraper distributes the sludge from the discharge point to a natural valley about a thousand feet long by several hundred feet wide. It is connected to a 2-wheeled plate carrier which runs on a track cable between the headpost and one of the tail masts. The operating cables permit the DragScraper to be hoisted free of the material—a great advantage over conventional hauling methods. A Sauerman 3-drum hoist provides DragScraper power.

(*Condensed from Sauerman News No. 148.*)

DragScraper Uses Island for Parking Lot Fill

An island in the Kalamazoo River was used for parking lot fill by the Harrington Construction Co. of Fennville, Michigan. The job was handled by a Sauerman 3-yd. Crescent DragScraper and carrier assembly used with an Insley WB crane.

The hoisting line of the Insley served as track cable, running from the hoist drum through the middle sheave of the boom tip to a tree anchor on the island. The drag cable was attached to the front chains of the Crescent.

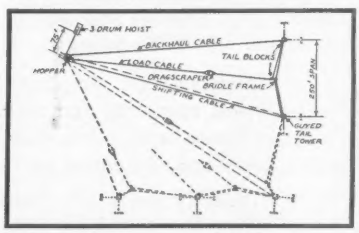
After digging and hauling to bank, the track cable was tensioned to lift the DragScraper and gravity return it to the excavation over 400 ft. away. Round trip took about a minute and a half. The 70-ft. crane boom was supported by two back stay cables leading from the boom tip to two tractors used as anchors.

(*Condensed from Sauerman News No. 149.*)

DragScraper Supplies Gravel for 82 Miles of Turnpike

More aggregate production was needed by Southern Michigan Materials, Inc. to supply structural and, upon completion, the maintenance and incidental needs for 82 consecutive miles of the Ohio and Indiana Turnpikes.

This demand was met with a new plant and a 5-yd. DragScraper which supplies gravel at the rate of about 275 tph. Digging goes to a depth of 75 to 80 ft. Power is provided by a Sauerman three drum hoist driven by a 325-hp. diesel. The rapid-shifting bridle provides a means of changing the DragScraper's line of operation by placing the tail block attached to the bridle in another position along the 250-ft. span between the two steel tail towers.

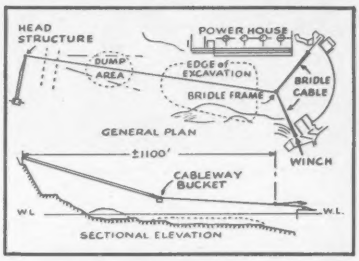


The hoist is pneumatically controlled by the operator from the hoist house. His location gives him excellent visibility of the entire pit and most of the plant.

The parent company, Northwest Materials, Inc., has completely excavated another pit nearby with a Sauerman 2-yd. Slackline Cableway. Northwest also uses a small scraper for stockpiling and reclaiming material from storage.

(*Condensed from Sauerman News No. 145.*)

De-Rocking a Tailrace



When the Washington Power Co. completed its Cabinet Gorge power plant and dam, an accumulation of rock at the discharge of the draft tubes had to be removed to insure unobstructed flow for the tailrace.

A Sauerman 2½-yd. Slackline Cableway, equipped with a rapid-shifting bridle system, was selected to do the job. Over 28,000 cu.yds. of rock varying in size from 6 in. to 5 ft. have been removed since the Slackline was installed. It is a permanent installation and is used periodically to clear the area in front of the draft tubes.

The Slackline operates on a 1000-ft. span. Material is excavated from 35 ft. of water and conveyed in the 2½-yd. bucket to a waste pile about 150 ft. below the tubular steel head mast. Power is supplied by a hoist located 190 ft. from the mast. The bucket and carrier assembly rides on a track cable, the lower end of which is attached to a rapid-shifting bridle frame controlled by a 10-hp. motorized spool-type winch. The rapid-shifting device permits the bucket's line of operation to be shifted laterally.

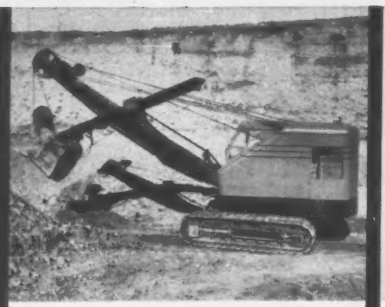
(*Condensed from Sauerman News No. 143.*)

MORE NEWS AND INFORMATION

Issues of Sauerman News giving greater detail about the installations on this page are available on request. For full information, tell us your interest or requirements and ask for catalog. Contact Sauerman Bros., Inc., 632 S. 28th Ave., Bellwood, Ill.

P&H DIESEL ENGINES

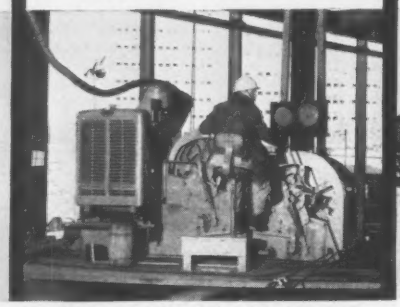
Powered by a 3 cyl. P&H Industrial Diesel



Powered by a 6 cyl. P&H Industrial Diesel

Powered by a 3 cyl. P&H Industrial Diesel

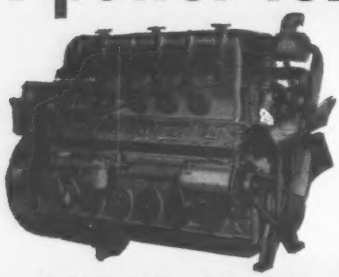
Powered by a 3 cyl. P&H Automotive Diesel



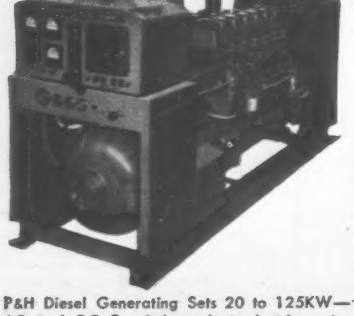
Hoist powered by a 3 cyl. P&H torque converter unit

Powered by a 6 cyl. P&H Industrial Diesel

A-1 power for A-1 construction work



P&H Industrial Diesel 2, 3, 4, and 6 cyl. models from 40 to 280 H.P.



P&H Diesel Generating Sets 20 to 125KW—AC and DC For independent electric motor driven equipment.

Equipment powered with the P&H Diesel functions smoother, faster and more efficiently with less down-time for restarts, servicing and repairs. This means a better job done faster—more production at greater profit to the owner.

Check these profitable performance features of the P&H Diesel:

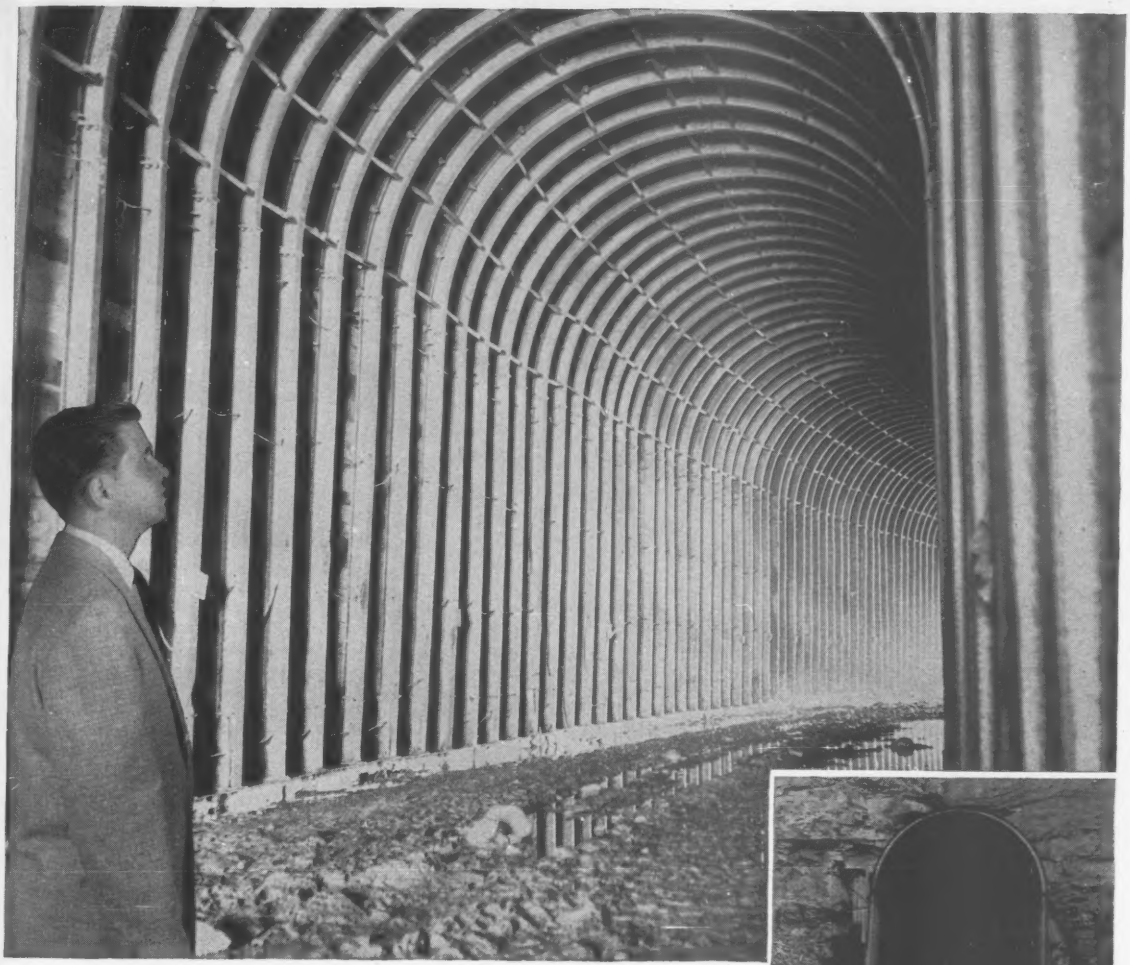
- **More Power**
- **Faster Starting**
- **Better Idling**
- **Higher Torque**
- **Better Governor Control**
- **Greater reserve strength**

Efficiency and simplicity of P&H Diesel design assure lowest operating and maintenance costs. The P&H Diesel operates best on low cost No. 2 fuel oil. It has 25% fewer parts and all wearing parts are completely interchangeable.

Specify the P&H Diesel for your construction equipment. For additional information see your P&H dealer or write for Bulletin Z-26.

HARNISCHFEGER

P&H Diesel Engine Division • Crystal Lake, Illinois



Completed tunnel support structure —overall height 28 feet, length approximately 600 feet.

B & O Approves Commercial Shearing and Stamping Fast, Safe Tunnel Lining Support . . .

Construction of a dam by the U. S. Army Corps of Engineers, Huntington District, near Sutton, West Virginia, meant the relocation of a railroad—and tunneling through a mountain for the B & O. Preliminary drillings indicated that the ground was not self-supporting and that considerable water would be encountered.

Because of their previous successful association with Commercial on other similar jobs, the B & O again approved Commercial Shearing and Stamping steel tunnel ribs to support the ground until the permanent concrete lining is placed.

Engineers from Commercial — working with the contractor — submitted design specifications which were approved by the B & O and the Corps of Engineers. Steel tunnel support ribs and water-bar lagging plates were then fabricated and delivered to the job site.

Careful preliminary engineering paid off . . . workmen were continually able to hold the structure close to the heading. And, all during construction the water-bar lagging plates diverted water to the extreme sides of the tunnel. These same plates prevent water from dripping onto the green concrete as it is being poured — assuring a permanently strong lining instead of one that is weakened and honeycombed.

Most important of all, the steel tunnel support job was finished ahead of schedule . . . and was sufficiently strong and durable for the contractor to defer placing of the concrete lining through the winter months and still hold the project to completion schedule.

Complete information on Commercial's steel tunnel supports — engineering help, too — is yours for the asking. Write, Dept. E16, The Commercial Shearing and Stamping Company, Youngstown 1, Ohio.

COMMERCIAL
shearing and stamping

Chicago's two-level Wacker Drive is extended past post office, at left, for connection with Congress Street superhighway. Contractor: Herlihy Mid-Continent Company. Re-bars supplied by Ryerson.

Are you getting this 4-point service on reinforcing bars?

Pictured here is the Ryerson reinforcing products department where large stocks of Hi-Bond type bars are carried. Here the worker is signaling into place a lift of 60 ft. re-bars.

Contractors say there are four reasons why they keep coming back to Ryerson for rebars:

1. Tremendous stocks to supply any job, large or small.
2. Dependable fabricating service to meet the toughest, tightest schedules.
3. Setting plans and accurate bar identification to make placement quick and easy.
4. Deliveries always on schedule—to the day or even the hour you specify. Yet never too early, so that steel piles up on the site.

Contact your nearest Ryerson plant for a lump-sum or average-pound quotation on your next job. You'll save time and money, too, by ordering all your other construction steel requirements from Ryerson.

RYERSON STEEL

IN STOCK—Re-bars and Accessories • Spirals • Wire Mesh • Open Web Joists • Forms For Concrete Joists • Tubing • Structurals • Safety Plate • Stainless • Mansard Pattern Siding • Expanded Metal • Grating • Caisson Rings, Etc.

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THE CONSTRUCTION WEEK

AF ACADEMY PROGRESS CRITICIZED—A Board of Visitors, including several congressmen, expressed dissatisfaction with construction progress at the Air Force Academy site in Colorado Springs, Colo. Col. Elgin Scott, executive officer of the AF Academy Construction Agency, admitting that the work is slightly behind schedule, points out that at this early stage of the project much of the work finished is "the type not easily seen. That includes utilities, roads, electric plants, water lines and reservoirs." He reports that $85 million worth of contracts has been awarded and $15 million of construction completed (see page 50).

BASIN STUDY BOOSTED—Ford Foundation funds to the tune of $131,000 will go into a study to determine what type of governmental agency might best control water resources of the Delaware River in the future. Delaware River Basin Research, Inc., will have the money to spend, and will also have the results of a 3½ year, $2 million study of the Corps of Engineers, currently looking into best use of the Delaware for the benefit of its four riparian states. The research corporation was established by the Delaware River Basin Advisory Committee, which is a group composed of six members from each state—New York, New Jersey, Pennsylvania, and Delaware. The Engineer Corps study, under Lt. Col. J. C. H. Lee, Jr., of the Philadelphia District, is primarily to report to Congress on the basin's needs; use of the Corps' findings for the private group's independent studies is secondary.

TO MAKE THE ICE—Seattle City Light, at a cost of $140,000, will own the equipment for freezing the ice barrier at $15 million Gorge High Dam on the Skagit River (ENR Mar. 7, p. 28). And it will direct Merritt-Chapman & Scott and Savin Construction in the methods to be followed in forming the ice wall to prevent water from seeping into the dam excavation. Additional equipment will be purchased also from the contractors to lower the brine temperature from —20 to —45 deg to stop leaks through the ice curtain.

ROADS OF ANOTHER STRIPE—Apparently North Carolina's prisons are going to remain under control of the State Highway and Public Works Commission for some time to come. Since the beginning of his first term, four years ago, Governor Luther H. Hodges has been trying vainly to separate the prison system from the highway department, and just when it seemed that victory was in hand, a State Senate legislative committee balked. It appears that with insufficient money in the General Fund to finance the change-over, the highway department will have to foot the bill—which would run an estimated $4 million. Critics of the separation objected on the grounds that it would force the highway department to hand a blank check to an agency over which it had no control.

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WASHINGTON OBSERVER

- **Congress to put eye on tight money**
- **New hope for housing law**
- ***Status quo* for road administration**
- **Senators move from Beck to Scranton**

● **The scarcity of money is, finally, going to get government scrutiny.** But the inquiry will come from the Democratic-controlled Senate Finance Committee, rather than from a commission appointed by the President. The chairman, Sen. Harry F. Byrd, has taken control and will begin a broad study soon.

Shortage of housing credit will be high on the list for inquiry, as well as the failure of the lease-purchase program, and the impact of high interest rates on school construction.

Some new headline names will emerge from the investigation. Sen. Robert S. Kerr to date known primarily for oil and gas legislation, is the ramrod behind the Finance Committee program. Sen. Byrd will show up as a critic of high interest rates; his forte has been government economy.

● **A coalition is forming to try to salvage a new housing law this session.** The hurt housing industry is caught up in a dispute between factions in the House of Representatives headed by Rep. Olin Teague on one side and Rep. Albert Rains on the other. If an in-between settlement can't be found soon, the prospects for a new law that might help stop the housing slump will get dimmer and dimmer.

The Administration quickly released its announcement of March starts —down to an 880,000 annual rate—last week in order to aid the forming coalition. The group is made up of Administration officials, housing industry representatives, veterans organizations and leaders of veterans affairs matters in the House.

The main battlegrounds: Rep. Rains' banking subcommittee proposal to give veterans preference on downpayments, excusing veterans the ½% insurance premium required of non-veteran buyers, and the proposal to earmark $1 billion of the National Service Life Insurance fund for veterans mortgages and advance commitments. Opponents say if such legislation passes the House, the fight will delay consideration in the Senate and invite a Presidential veto.

The coalition program: reduce downpayments for FHA mortgages even lower than previously recommended by the Administration. In March the Administration proposed a new range of downpayments: on a $10,000 house, $400 instead of $700; on a $14,000 house, $1,000 instead of $1,700; on a $20,000 house, $2,500 instead of $3,200. The coalition would bring the lowest downpayment down nearly to $200, the middle to around $600, and the higher to not more than $2,000.

● **The idea for an independent highway administration is dimming.** Highway chief Bertram Tallamy is winning the confidence of Congressional leaders. And, as of now, there is little support for Sen. Albert Gore's proposal to set up a commission outside the Commerce Department.

● **The McClellan committee inquiry is getting into construction labor.** The hearings this week on labor violence in Scranton, Pa., center on evidence of law violations by union officials still holding office, as well as those who have been indicted and tried. The major charge: too few free elections among the building trades locals. At stake is the drive of the building trades to get special legislation—to be able to sign contracts requiring membership of workers within seven days after going to work, rather than having to wait for a union shop election.

Factory-Made Heavy-Duty Pavement

Precast, Prestressed 'Incor' Concrete Pavement Slabs Used in Widening New Jersey Approach to 3-Tube Lincoln Tunnel

● Completing the 3rd Tube of Lincoln Tunnel and its complicated approaches without traffic interference is an outstanding achievement. Typical of how The Port of New York Authority engineers public convenience into such projects is the North Bergen, N. J. Approach Viaduct widening.

Poured-in-place concrete would have tied up traffic. Precast, prestressed paving slabs were the public-serving answer. A total of 263 5-in and 6-in. slabs, respectively 20 ft. x 6 ft., and 10 ft. x 20 ft., were used. Fast, economical installation again confirmed the advantage of quality members, fabricated to closest tolerances, under factory-controlled conditions.

Confirmed again, as well, is the advantage of using 'INCOR'* 24-Hour Cement for assembly-line speed—maximum output at minimum forming and prestressing cost . . . dependable high early and high ultimate strengths . . . utmost realization of prestressing's advantages. *Reg. U.S. Pat. Off.

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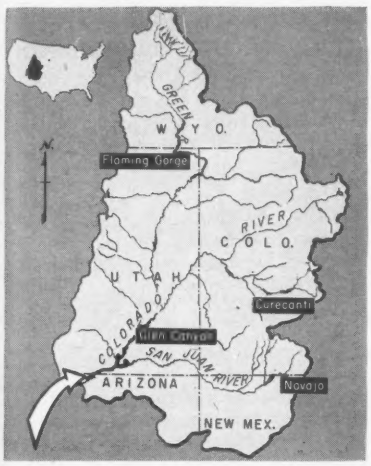


Glen Canyon Dam and its key Upper Colorado Project powerhouse bring three huge bids—all under USBR's estimate—as . . .

Merritt-Chapman Does It Again!

The Bids—

1. Merritt-Chapman & Scott Corp. $107,955,122
1. Glen Canyon Constructors .....$118,336,476 (10 companies)
3. Joint Venture .....$120,178,853 (9 companies)

In heavy construction circles last week, an uncommon tenseness prevailed as the nation's biggest dambuilders converged on Kanab, Utah, armed with their best estimates of what huge Glen Canyon Dam and its powehouse should cost.

The U.S. Bureau of Reclamation came to Kanab concealing an estimate that the initial Upper Colorado River Project work would cost $135.6 million. But all three bidders brought sealed proposals to beat that.

It was Merritt-Chapman & Scott Corp. that was the lowest—the same MC&S that just a year ago broke the previous record for dollar size of a single construction contract with its $91 million winning bid on the Columbia River's Priest Rapids Dam (ENR Mar. 22, 1956, p. 21) on which first concrete will be placed this month.

In bidding, alone and unassisted, on Glen Canyon, MC&S has thus twice gone counter to the usual practice of using joint ventures for such big jobs. Its two competitors in the bidding this time were veritable platoons of contractor forces—Glen Canyon Constructors, a ten company combine, plus a nine company outfit that included two veterans of the Big Six that built Hoover Dam (on a $48.9 million prime contract) in the Thirties.

Announcement of an award is expected in about two weeks.

The bidding came as a joyful surprise to U.S. Bureau of Reclamation engineers who admitted that it was a gratifying switch from recent USBR experience. (In sharp contrast are its recently awarded tunnel and dam contracts on the Trinity River Project in California, which totaled a cool $20 million above estimates. Glen Canyon's $27.6 million "paper" saving indicated by the low bid would wipe this off the books, and then some.)

Glen Canyon Dam—part of a $760 million basin plan—will be second only to Hoover in height; it will rise 700 ft from bedrock in a canyon just 13 miles downstream from the Utah border in Arizona and 16 miles above Lee Ferry, the point at which the upper and lower basin distinction is made on the Colorado.

It will exceed Hoover's 3¼ million cu yd volume of concrete with a total of 4,770,000 cu yd in the dam alone. Only Shasta's 6½ million cu yd and Grand Coulee's 10½ million will exceed it among completed concrete dams in the U.S.

It is an arch dam—not arch-gravity. In fact its designer in Denver calls it a thin arch.

Cement and pozzolan—combined in its concrete in a mix to be designed only after aggregate sources are located, approved and tested—were not included in last week's bidding. USBR will purchase these separately and has not advertised for bids on them as yet. Pozzolan used will be natural material rather than flyash as used at Hungry Horse Dam in Montana.

Mix for the dam will be something on the order of ½ bbl of cement and ½ bbl of pozzolan per cubic yard of concrete.

The contractor has the option of placing concrete in 5 ft or 7½ ft lifts (the 7½ ft being a departure for USBR

jobs and in use only at Table Rock Dam in Missouri on a Corps of Engineers project). Cooling pipes embedded between lifts will be required for further cooling of concrete placed at a specified temperature of 50 F.

A major construction problem is isolation. USBR will build a construction town on the river's south bank, and until this is readied construction workers are to be paid a special rate.

Nearest railhead is at Flagstaff, Ariz., 135 miles away, and a rail line to the site has been considered impractical. Access roads are under construction now under separate contracts. A bridge over the 1,000 ft wide canyon (see picture) is not expected to be completed for two years.

Layout of concrete plant will be critical; cableways will undoubtedly be used as the concrete placing system. Early cableway installation is important for gaining access to the bottom of the 700 ft gorge.

Aggregate production, too, will be a critical problem since haul distance and haul-road grades have such heavy bearing on costs. The recommended source is a quarry site eight miles up a side canyon. A haul road to this site would be so vulnerable to washout that conveyer-belt delivery of aggregate is a more likely choice.

The mixing plant will probably go on Glen Canyon's north side, since that's the side of the probable quarry site.

Climate should be on the side of the constructors—good for year-round operations. The townsite is at El 4,300 where cool summer nights (good for concreting) can be expected. Winter cold spells are seldom long, and rainfall averages but 6 in. per year.

The large contract that was bid last week is for a period of 2,500 days—nearly seven years. The contractor will have an escalator clause for labor costs.

The Bidders

• Merritt-Chapman & Scott Corp.
New York City

• Glen Canyon Constructors, a joint-venture including—

Guy F. Atkinson Co., South San Francisco; American Pipe and Construction Co., South Gate, Calif.; The Arundel Corp., Baltimore, Md.; The Hunkin-Conkey Construction Co., Reno, Nev.; L. E. Dixon Co., San Gabriel, Calif.; Isbell Construction Co., Reno, Nev.; Al Johnson Construction Co., Minneapolis, Minn.; Charles L. Harney, Inc., San Francisco, Calif.; J. A. Jones Construction Co., Charlotte, N. C.; W. A. Hettewell, Inc., Oakland, Calif.; Ostrander Construction Co., Portland, Ore.

• A nine-member joint venture including—

Morrison-Knudsen Co., Inc., Boise, Idaho; The Shea Co., Alhambra, Calif.; Brown & Root, Houston, Tex.; Perini Corp., Framingham, Mass.; Perini Ltd., Toronto, Canada; Ralph E. Mills Co., Frankfort, Ky.; and F & D Construction Co., Butte, Mont.

Break-Down of Bid Prices

Common excavation first 500,000 cu yd, MC&S bid $3.30 per cu yd and USBR estimate was $4.50. Over 500,000 cu yd (485,000 cu yd in this item), MC&S —$.60 per cu yd and USBR—$3.50.

Rock excavation first 800,000 cu yd, MC&S bid $5.00 per cu yd and USBR —$7.50. Over 800,000 cu yd (850,-000 cu yd in this item), MC&S bid $1.50 per cu yd and USBR—$6.50.

Excavation all classes in open cut for spillways, 1,325,000 cu yd, MC&S bid $2.87 per cu yd and USBR—$3.58.

Concrete Dam first 2,400,000 cu yd, MC&S bid $11.00 per cu yd and USBR —$16.90. Over 2,400,000 cu yd (2,370,000 cu yd in this item), MC&S bid $9.50 per cu yd and USBR—$11.00.

He will pay such costs fully until May 31, 1959. After that, the government will pay 85% of additional costs if wages rise, or be credited for 85% of savings if wage rates go down.

Construction began last fall on a 2,768 ft diversion tunnel through the right wall of the canyon. Mountain States Construction Company of Denver has a $2.5 million contract to drill the 44 to 47 ft dia bore. A second diversion tunnel will be put through the left abutment, and upstream and downstream earth cofferdams will be used in dewatering the site.

Glen Canyon is the first and biggest unit of the Upper Colorado River storage project. Its 900,000 kw powerplant (in eight 112,500 kw units) will produce power for pumping water through vast irrigated areas—to say nothing of revenues for 50 year repayment of costs. It will create a 28 million acre-ft reservoir—about 20 million acre-ft of usable storage stretching 186 miles upstream.

Next unit to be bid—late this year or early next—will be Flaming Gorge Dam, a million-yard concrete arch dam on Green River in northwest Utah. Navajo Dam, a 29 million cu yd earthfill on the San Juan will follow.

The Curecanti unit of the vast basin project is still under investigation. It could entail three or four dams to round out the total $760 million estimated cost of the entire basin plan.

Traffic Engineers Award Is Offered for Research

The Past Presidents' Award of the Institute of Traffic Engineers is being offered again this year. Presented for the first time in 1951, this award is made to engineers in the field of traffic who conduct and report independent and original research.

Competition is open to Junior and Associate members of the Institute under 35 years of age. Entries consist of a written report of research carried on during the last three years. Closing date is July 23.

Counties Are Denied Power Of Contractor Examination

Virginia counties are without authority to enforce local ordinances requiring local examination of contractors, Virginia's Attorney General J. Lindsay Almond, Jr., ruled last week.

The ruling was made after E. L. Kusterer, Executive Secretary of the Virginia Contractors Board, had challenged ordinances of Henrico and Chesterfield Counties. The Attorney General said that the commonwealth had preempted the field when it had established the State Registration Board for Contractors.

Mr. Kusterer said that the right of a county to tax contractors was not in issue. "What is questioned," he said, "is the counties' right to require registration before bidding or offering to accept orders or contracts, and a qualifying examination from contractors who already have qualified and are registered under the state law applying to jobs costing $20,000 or more."

The Attorney General pointed out that the ordinances in both Henrico and Chesterfield Counties require an examination similar to, or more difficult than, that given by the State Board.

In summary, the Attorney General said: "I am of the opinion that the licensing is a state-wide problem and, inasmuch as the legislature has seen fit to provide for the licensing and registration of contractors on a state-wide basis, then a political sub-division is without power, unless expressly given, to pass an ordinance in a matter which the legislature already has specifically provided for."

Both Henrico and Chesterfield are suburban Richmond Counties and both are the scene of heavy construction programs.

Added Indictments Asked In the Penn Pike Probe

A special grand jury probing the long-standing charges of corruption and other criminal action in operations of the Pennsylvania Turnpike last week recommended that 23 more persons be indicted on various charges.

The additional indictments—mostly on charges of criminal conspiracy—were urged on the Dauphin County (Harrisburg) Court.

Principal targets for action, the jury said, were G. Franklin McSorley, recently suspended as Chairman of the Turnpike Commission; former Com-

mission Chairman Thomas J. Evans; suspended commission member James F. Torrance, and numerous other former employees of the commission and persons with whom the commission did business.

Mr. McSorley—already under indictment on misconduct charges, would be charged in the new indictment with criminal conspiracy, as would Mr. Evans. Mr. Torrance would be charged with conspiracy, malfeasance and "cheating by fraudulent pretense." Both Mr. Evans and Mr. Torrance also are under previous indictments.

The charges grew out of a running attack on the commission, directed by Gov. George Leader. He also has sponsored bills now before the state legislature that would abolish the Turnpike Commission completely, turning the tollroad over to a caretaker agency which eventually would make the road free.

Dangerous Work

Construction industry is fifth worst in nation for disabling accidents, deaths

Of forty major industries reporting to the National Safety Council, only four have higher accident rates than the construction industry, according to Maj. Gen. G. E. Galloway, Missouri River Division Engineer for the Corps of Engineers, U. S. Army.

In a talk prepared by Gen. Galloway but given for him by Col. E. C. Adams, Kansas City District Engineer of the Corps before a recent meeting in Kansas City of the Central States Safety Council, the construction industry safety picture was cited as greatly improved but still in need of attention.

Although, "the old rule of thumb that one man would be killed for every twenty million yards of earth moved, and one man die for every floor of a building construction job, is out the window," the General stated that the "approach to safety obligations must be positive, not passive."

Gen. Galloway pointed out that by NSC figures, the year 1955 saw 2,400 workers killed and over 200,000 injured on construction jobs throughout the country.

For proof that these deaths and injuries can be reduced, the General referred to the record of work done under the jurisdiction of the Mississippi River Division of the Corps. Since almost all of the work done for the Corps is by contract, the Corps itself has only an indirect control over safety measures taken in the field. However, contractor cooperation with the safety provisions embodied in C. of E. contracts has resulted in remarkable safety records. Approximately 80% of all contractors working in the Missouri River region in 1956 had no lost time accidents on their jobs. On one project, a $5.6 million flood-control job involving seven general and 13 subcontractors, there were more than 200,000 man hours of work without a single reportable accident. On a $13 million building project at Fort Riley, Kansas, more than 800,000 man hours were put in with only three lost time accidents having occurred.

How to Build Better

BRI offers some answers at its annual meeting

Present building methods were closely scrutinized this week at the Sixth Annual Meeting of the Building Research Institute, in Chicago. And a multitude of excellent suggestions were offered.

The cost-saving and quality-improving recommendations were developed during sessions on machine applications of materials at the site, painting, weatherproofing building exteriors, use of full-scale mock-ups in design, panel cooling and heating research and experience with multistory apartment buildings.

• **What experience shows**—Otto L. Nelson, Jr., New York Life Insurance Co.'s vice president for housing, drew on his firm's experience with design, construction and operation of about $100 million in rental housing. [New York Life built and operates 3,000 apartment Fresh Meadows, (with 13 story buildings), 581 apartment Manhattan House (with 21 story buildings) in New York City, and 2,000 apartment Lake Meadows (with 21 story buildings) in Chicago.]

Seeking to coordinate the viewpoints of designer, builders and operator, Mr. Nelson said his company gives more attention to the site plan than is normal. He prefers large sites because then the neighborhood can be controlled and thus deterioration or obsolescence by others is prevented. Special consideration is also given lobbies, to heighten first impressions, and to bathrooms—generous use of tile and large medicine cabinets—and kitchens—large size, with plenty of cabinets, big refrigerators and built-in ranges. Adequate wiring is another must. And he favors providing as much window area as possible.

As to types of construction, Mr. Nelson said, "We have found reinforced concrete flat-slab construction entirely satisfactory for buildings up to 22 stories. When care is taken with the formwork, the cost of lathing and plastering is eliminated, although the ceilings do require some finishing. We believe it is better to have uniform formwork and maximum re-usage rather than to change column sizes to save concrete.

"The use of lightweight exterior skin walls has helped to reduce the cost of concrete structural systems. On the skin-type buildings we have constructed at Lake Meadows, the window frame runs as one unit from spandrel to spandrel with a continuous panel of either (asbestos-cement) or glass from the spandrel to sill height and a continuous line of sash from sill height to ceiling. We use standard-section steel window frames and sash that are hot-dipped galvanized and bonderized. So far, over a four-year period, we see no evidence that it will be necessary to paint these sections. . . ."

• **Better weatherproofing**—Fred Virgili, specifications department, Friedman, Alschuler and Sincere, Chicago architects, offered several valuable suggestions for improving roofing.

▶ Flashing should terminate from 8 to 12 in. above the roof line. A wall should never be coated above this flashing with a coating resistant to air passage, because this may cause spalling.

▶ Cant strips are advisable to protect the base of the flashing. The cant must end at the base of the raggle joint.

▶ Roofer's membrane flashing should be installed behind metal base flashing to protect the roof if a metal joint should open. A small 45 deg bend at the break in the base flashing is advisable to prevent it cutting the roofer's felt during installation. The base flange should be secured to the roof and then double felt stripped.

▶ The metal flange should be primed with bituminous paint to permit a better bond between metal and roofing. The base flashing must be set on top of the roofing and then stripped.

▶ At pitch pans, which are used where angles or small metal pipes extend through the roof, it is not advisable to place membrane flashing against the metal. For in summer, the metal gets hot and dries out the membrane or mastic or causes it to slough. To prevent contact with the metal, call for 1 in. of roofer's mastic, then a sprinkling of dry portland cement and finally the pitch or asphalt.

▶ Roof drains should have a copper or lead flange that can be set on top of the roofing and then felt stripped. The metal flange should be securely clamped into the drain on the inside.

• **Machine applications**—In a session on mechanization, use of power tools of various types was explained by the manufacturers. Included were electric power tools, sprayers for plaster, pneumatic staplers, machine nailers and powder-actuated tools.

Spectators take in the show at Oahe Dam as . . .

The Mole Comes Through

The growl grew louder as the rock barrier thinned. Then the remaining wall of shale glowed from the lights behind it. Finally the rock shattered in big flakes. And poking through the 24 ft dia tunnel opening was the snout of the "Mole"–a 72 ft long mechanical miner equipped with a revolving tooth-studded cutterhead the diameter of the bore–which had clawed away at the tunnel heading to dramatically hole through.

Thus did the $350,000 machine (ENR Dec. 2, 1954, p. 24) last week wrap up the first and largest engineering job carried out by a continuous miner –finishing the last of six 3,750 ft long flood control tunnels for Oahe Dam at Pierre, S. D.

The first Mole–there are two on the job–was designed and built for Mittry Constructors of Los Angeles, holders of a $9.5 million contract for the upstream half of the flood tunnels at the $350 million Corps of Engineers project on the Missouri River. Mittry started tunneling in April 1954, then subbed the remainder of the job to a combine called Oahe Constructors.

The combine finished the Mittry contract and then built another Mole for use on the downstream sections, for which they held a $5.8 million contract. It was this second machine that holed through the last tunnel.

Records were set as the Mole ate its way through the 21,231 ft of tunnel (ENR Jan. 13, 1955, p. 26). Overall average figured out at 50 ft a day–at times the Mole drilled as much as 140 ft a day. In comparison, conventional tunneling methods at other Missouri River dams resulted in about 24 ft a day.

Still to come at Oahe is the drilling of seven power tunnels on the opposite side of the river. When they are finished the combined length of the dam's power and flood tunnels will run to 8.5 miles.

Legislation Lags

National pattern is drab from a construction angle

Although many of the state legislatures were still in session–and would continue their debates for some weeks–enough had finished deliberations last week to show a national pattern.

The pattern was a drab one, at least from construction's viewpoint. The amount of new legislation forthcoming, according to an ENR check, has been surprisingly little, and very few of the measures approved or under consideration seemed to have more than very small local significance. Several of the legislatures in session now for more than a month had actually done nothing at all about passing on laws. Several others–suddenly coming onto the final day of their prescribed session–shoved literally thousands of measures through the hopper with what seemed to be no real consideration at all.

As indicated in earlier checks, much of the material that came under the state lawgiver's eyes concerned the states' part of the national highway program. But other matters, notably state building programs, also came up.

A breakdown of what's transpired so far, according to ENR's correspondents and news bureaus, runs this way:

• **Highways–Arkansas** appropriated $164.5 million for road work, defeated moves to have the state pay utilities for moving lines in the path of new roads. **Colorado** approved an $18 million bond issue to finance a Continental Divide tunnel–if federal funds can be obtained for approach roads.

Delaware will appropriate a share of its state motor vehicle tax receipts to aid cities in street maintenance.

Georgia, along with **North Dakota, Tennessee** and **Wyoming** instructed its State Highway Department to pay costs of relocating utilities, and **Oklahoma** and **Ohio** authorized sharing costs with utilities for such relocation.

Appropriations for highway purposes included: $248 million in **California**; $177.5 million (for all state purposes) in **Idaho; Rhode Island**, $101 million–mostly for highway use; $300 million for highway work for the next biennium in **Washington** state.

Tax raises to provide added funds to meet federal appropriations were not faring too well, although **Indiana, South Dakota** and **Wyoming** did approve rises. But **Kansas, Montana** and **New York** killed measures that proposed such rises, and **Pennsylvania** was threatening to reduce the state's tax by one cent.

• **Other measures–Arkansas, Colorado** and **Nebraska** approved water conserva-

tion measures, creating commissions to regulate the drilling of wells and the creation of conservancy districts. **Washington** took steps to end pollution of Lake Washington near Seattle, by approving the formation of a metropolitan district of cities bordering the lake to work out the common problem of treating sewage.

Labor and social welfare matters came up in many states, and the results were about evenly divided. **Iowa, Idaho** and **Maryland** killed right-to-work laws (in **Iowa** changes in an existing law were proposed), but **Kansas** approved such a law for submission to voters as a constitutional amendment. Four states increased compensation benefits.

Other actions ranged wide, all the way from **Tennessee's** refusal to accept federal aid for schools to **Kansas'** setting of an official speed limit of 70 miles per hour during daylight hours—highest in the nation. They included the defeat, in **Nebraska,** of a measure that would have given local contractors preference over out-of-staters on state work; **Wyoming's** new requirement that out-of-state employers must post $1,000 bonds to guarantee payment of state taxes and salaries.

There were special measures—such as **Washington's** permission to the City of Seattle to raise extra taxes to pay for straightening of a section of the Duwamish River, and **Georgia's** permission to Atlanta to raise $100 million in bonds to pay for expressway work in the city. And in **Texas,** the legislature killed a plan for urban renewal that was looked upon as the key for Fort Worth's spectacular "trafficless" downtown area rehabilitation.

Sanitary Engineers

October 1 is new deadline for no-exam certification

Those sanitary engineers specially qualified for certification without examination now have until October 1, 1957, to get their applications to the American Sanitary Engineering Intersociety Board for consideration.

The new deadline, extended from July 1, was adopted at a recent meeting of the board to permit members of the American Institute of Chemical Engineers, a newly voted sponsor of the board, also to enjoy the no examination privilege.

Briefly reviewed, certification without examination is possible if the individual has had at least 15 years' experience in addition to meeting other general requirements, which are: graduation from an accredited engineering college, registration as a professional engineer, high moral character and recognition by the profession. Those without 15 years' experience must have eight years of satisfactory sanitary engineering experience and take an oral and written examination (ENR Nov. 22, 1956, p. 29).

To date, the total number of engineers certificated without examination was found to stand at approximately 300 and to represent a cross section of sanitary engineer leadership.

Representatives of AICE elected to the board of trustees and as members of ASEIB itself are: Larry W. L. Faith, vice president and chief engineer, Air Pollution Foundation, Los Angeles; R. F. Weston, Weston, Eckenfelder & Associates, Newtown Square, Pa.; K. S. Watson, consultant water management and water control, General Electric Co., Schenectady, N. Y.

At the same meeting, an invitation to the American Industrial Hygiene Association to become a sponsor of the ASEIB was authorized.

Mayfield Dam Delays Cost $21,000 a Month

Those delays in construction of its Cowlitz hydroelectric project have cost Tacoma, Wash., City Light an estimated $2 million to date—with $21,000 being added to this sum each month. The monthly figure represents standby charges the city is paying the general contractor while work is stopped over a deadlock concerning a state fish hatchery which would be flooded by Mayfield Dam.

And termination of the contract has been advised against by Dean Barline, Tacoma utilities director, since this would mean that the city pay about $2.5 million in damages to the general contractor, plus damages which might be claimed by subcontractors.

The hope now is to either purchase the hatchery or get a reversal of the State Supreme Court's decision that the city lacked authority to condemn the hatchery.

Delaware Revises Its Method Of Awarding Road Work

A revised method of handling contracts for dirt road improvements has been instituted by the Delaware State Highway Department.

Under the plan, separate contracts will be awarded for grading, surfacing or stabilizing work, instead of having both operations included in one agreement.

In this manner, one contractor can bid on the grading, clearing and drainage work and another can bid on the surface treatment or stabilization work on the same road, or the same contractor can bid on both operations.

Precedent-Setting Hangar Now Occupied

The first contingent of Trans World Airlines employees has now moved into the company's new $7 million airframe-overhaul hangar at Kansas City's Mid-Continent International Airport. The building will be ready for the remainder of the 2,500 man work force possibly by late July.

An innovation in hangar design when it was begun a year and a half ago, the 818 ft long building comprises a 100 ft wide center section, flanked on either side by a 150 ft wide folded-plate concrete roof, suspended by cables (arrow) from anchor walls surmounting the center section (ENR Jan. 26, 1956, p. 44).

Engineers for the project are Burns & McDonnell, of Kansas City, and Ammann & Whitney, of New York. Construction is a joint-venture of MacDonald Construction Co. of St. Louis, and Footer & Creighton Co., of Nashville, Tenn.

Ohio River Clean-Up

Sewerage programs in the basin sustain drive for pollution-free waters

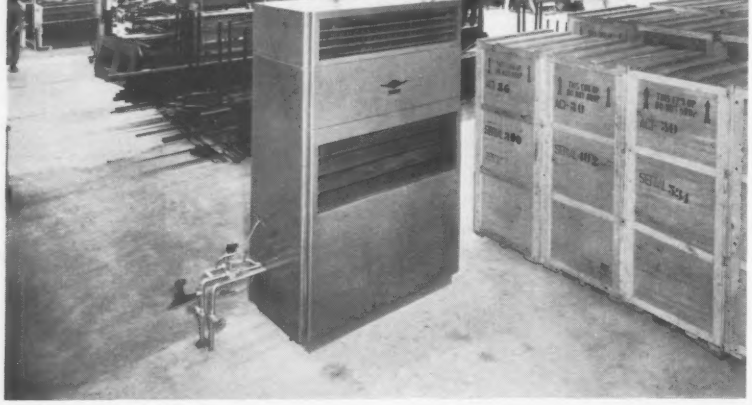
Facilities for treating the sewage of 75% of the 10 million people in the Ohio Basin drainage area are now in operation or under construction. And in Kentucky, one of the basin states, some kind of treatment is already provided, or will be soon, for 82.7% of the state's residents who have access to sewers.

The first piece of information was brought out at a recent session of the Ohio River Valley Water Sanitation Commission. The commission's out going chairman, Kenneth M. Loyd of Youngstown, Ohio, further disclosed that in his state the Mahoning Valley's major communities plan to spend $30 million at once for plants to treat domestic wastes being dumped into the Mahoning River. He also indicated that industries in the area are spending nearly as much on clean-up of industrial waste.

Kentucky's status in the sewerage picture was one of the points made in the Kentucky Water Pollution Control Commission's annual report for 1956, recently made public.

The report, in addition, credited new sewage treatment plants in nine Kentucky cities for major gains in the state's fight against stream pollution. The report also stated that progress has been and is still being made in the elimination of industrial wastes from public waters. It is the belief of Louis R. Birkel, Jr., executive director of the pollution control commission, that Kentucky is holding its own with other states in the continuing drive to eliminate pollution in the state's rivers and streams.

At the sanitation commission meeting, B. A. Poole, chief engineer of the Indiana Department of Health, was elected new chairman; Russel E. Teague, Kentucky Health Commissioner succeeded Mr. Poole as vice chairman.



Large Package Heat-Pump System Installed

A multi-unit heating and cooling system installed at the new American Coils Co. plant in Farmingdale, N. J., consists of 14 water-to-air heat pumps manufactured by this company and is said to be the largest of its kind anywhere.

Ten of the heat pumps are 10 hp units located in the 54,000 sq ft of unpartitioned manufacturing and shipping area. Two 7.5 hp units supply conditioned air to the 9,200 sq ft of office and lobby space. A 3 hp unit for the lunch room and a 5 hp unit for the labs bring the system to a total of 123 hp.

Total capacity for winter heating is 2 million Btu and for summer cooling the system is rated at 1.5 million Btu. No ductwork is needed for the circulation of warm air in the winter or the transfer of condenser heat in the summer. Temperatures in the building will vary between 70F and 74F in the winter and 75F to 80F in summer.

A 505 ft deep well with a capacity of 350 gpm will supply water at 60 psi for the heat-pump system. A 10,000 gal storage tank permits automatic valves on the heat pumps to control the individual pumps for better operation. The heat pumps are supplied independently through copper feed lines buried in the floor.

A Texas First

Construction work begins for executive airport

Tailored for executive plane use, Texas' completely executive airport located about 15 miles from downtown Dallas is now under construction.

To be known as Addison Airport, the $2.3 million venture by Addison Airport Inc., is expected to be in use by June 1957.

Featured are six hangars, two with 26,000 sq ft of floor space, and a $50,000 terminal building. Construction plans include 150 T-hangars, hard surface taxiways and ramps. Accessories will include night lighting for 24 hour operation.

The 5,000 sq ft terminal building which will house a restaurant, airport offices, pilots lounge, a briefing room, and weather teletype machines will have a full supported roof.

Two of the larger hangars will be of the full cantilever type. Two others will be conventional bowstring type hangars.

The main runway will be 4,500 ft long and 100 ft wide with a hard surface. Wind studies show that the main runway will take 97% of the traffic. A turf strip will be used during severe crosswinds.

Vice president and general manager of Addison Airport Inc. Henry Stewart says the need for the airport arises from the fact that Love Field is overcrowded and private airport facilities in the area are inadequate for the larger executive type planes. The main runway of Addison Airport will take a fully loaded Convair.

Previous studies made show that most of the potential customers of the airport live within a 10 to 20 minute automobile ride of the field.

The engineering firm for the airport is Homer A. Hunter & Associates of Dallas. Tecon Construction Co. is doing the work on the runways and the foundations for the two cantilever hangars. The hangars are being erected by Erwin-Newman Co. of Houston.

Niagara Power Compromise Set

Diverse groups near accord on modified preference clause, agree that New York State should build

Chances for enactment of legislation providing for Niagara power development appear brighter than at any time in the seven years the controversial issue has been before Congress. After three days of hearings before a Senate subcommittee, a compromise between private and public power groups on the only unresolved issue—the preference clause—appears near.

For the first time since the legislation has been before Congress, there is no bill calling for construction either by private enterprise or the federal government. Two bills before the Senate Public Works Committee call for construction by the Power Authority of the State of New York.

Primarily responsible for bringing the two groups together was the rockslide last June that knocked out Niagara-Mohawk Power Corporation's Schoellkopf hydro plant, resulting in a loss of 365,000 kw. This power loss has injected a sense of urgency into Congressional consideration. Industries in the Buffalo area testified that their present power supply, made available, to Niagara-Mohawk from Ontario Hydro, may be cut off within three years because of Canadian growth. So industry in the area is faced with getting a firm source of power or moving out.

A Republican-backed bill introduced by Senators Irving Ives and Jacob Javits, both of New York, calls for construction by the New York Authority but without the absolute preference provision found in most federal power projects. A Democratic bill, introduced by Sen. Joseph Clark of Pennsylvania and Rep. Charles Buckley of New York, contains the federal preference clause.

During the hearings last week, Gov. Averill Harriman of New York notified the committee of his backing of the Clark-Buckley bill, but said he would be willing to amend the bill to guarantee Niagara-Mohawk 445,000 kw from the potential 1.8 million kw of the project to make up for the loss from the rockslide. This would be made contingent on Niagara-Mohawk giving up its own license to develop the power.

During the hearings, Senator Javits amended his bill to spell out preference for rural electric cooperatives and municipally owned distribution systems. He called for allocating "reasonable amounts" of power for present and "reasonably foreseeable future needs," and included withdrawal provisions in contracts with industry and private utilities so that fractional amounts of power might later be recaptured to meet requirements of public groups.

Representatives of private utility companies involved testified in favor of construction by PASNY, but opposed inclusion of an absolute preference clause. Earle J. Machold, president of Niagara-Mohawk, and Robert Ginna, president of Rochester Gas & Electric Corp., conceded under sharp questioning that they would accept—but not happily—a preference clause that allocated "reasonable" amounts for rural co-ops, municipalities, and federal installations.

Industry representatives, who testified that expansion plans had been stymied by the power crisis, indicated they would be satisfied with any bill the committee reported, so long as it provided power to replace that lost by the rockslide.

Sen. Robert Kerr, chairman of the subcommittee, said in his opinion the majority of his committee wants to report a bill that will provide for speedy construction of power facilities at Niagara Falls. "But Congress, in my judgment," he said, "is not going to pass a bill that does violence to half a century of record on federal preference."

Earlier, Robert Moses, chairman of PASNY, had warned the committee that unless a "workable bill" without the federal preference provision was approved, the state agency would not be able to market the $600 million in bonds to finance the project. Chairman Moses testified in support of the Ives-Javits bill and said that his authority observed preference rights of rural cooperates and municipally owned distribution systems, but that inclusion of the "open-ended" federal preference clause would prejudice the sale of bonds.

The subcommittee is expected to act fairly speedily so that the legislation can be moved to the Senate floor after the Easter recess. The House has not yet acted.

Apartment Balconies Offset for Headroom

The backyard barbecue, a hallmark of modern indoor-outdoor living, will move upstairs with the construction of a $10 million apartment house soon to be built in Los Angeles. Dwelling units in the 14 story building will have outdoor balconies with fireplaces.

To heighten the outdoor feeling, architects Victor Gruen & Associates, of Los Angeles, worked out a scheme of staggered floor layouts that will give tenants two stories of balcony headroom, even though all apartments are to be one-story. The upper part of the resulting 2 story wall behind each balcony will contain kitchen and dressing-room windows of the apartment upstairs, but outside louvers will block the line of sight between windows and balcony living level, thus preserving the privacy of both tenants without shutting out light and a view from the upstairs unit.

The new development will be constructed by Tishman Realty & Construction Co., Inc., of New York.

Why the Seaway Needs $35 Million More

Congress is asked to increase Seaway borrowing power limit to meet higher prices and added items

Construction of the St. Lawrence Seaway is going to cost at least $165 million more than was originally estimated.

Since 1953, the estimated cost of construction on the U. S. side of the river has gone up 100%—from $67 million to $133 million. The corresponding rise for Canada's larger portion of the project has been 45%—up from $196 million to $285 million.

Only part of the increase has been due to rising construction prices. Most of it has resulted from additions and changes in project plans. That was made clear last week to the House Public Works Committee by Administrator Lewis G. Castle of the St. Lawrence Seaway Development Corp.

Mr. Castle testified in support of an Administration bill to increase the U. S. corporation's borrowing authority by $35 million. The legislation would raise the agency's debt limit of $105 million to $140 million and permit interest to be deferred during construction, as is done under the 1954 act that created the corporation.

• **Higher prices**—Price rises since December 1952 are held to account for $19 million of the increase in the construction cost estimate. Added construction items account for $37 million; and design changes for $10 million.

Increased costs, however, may exceed these figures. The largest and most expensive of the added items—dredging of the South Cornwall Channel—has twice failed to bring in an acceptable bid so that this job alone may boost estimated costs by many millions.

At the initial bid opening in February, only one proposal came in—to negotiate a contract at a high price. On readvertising, the job was split into five sections to be bid separately or in combination. Two dredging firms and six bidders on a dry land section entered proposals for a March 4 opening. The low total for the work was $32 million. S. J. Groves and Sons Co. has been awarded the dry excavation on a $2.3 million bid, well below the engineers' estimate, but the dredging remains an unsolved problem.

Decision cannot be too long delayed. Dredging of the tough bottom in the fast-flowing South Cornwall Channel has to be completed for scheduled 14 ft navigation by July 1, 1958 and for 27 ft, a year later. The corporation and its construction agent, the Corps of Engineers, are negotiating with the dredging contractors for lower prices and, also, are considering use of hired labor to do the job with government-owned or rented equipment.

• **Added items**—Other added items and changes in original plans have built up a net increase of $47 million over original estimates of the $19 million for higher construction prices. Some of the changes have resulted in savings. But a House appropriations subcommittee last month wanted to know why original Corps of Engineers plans and estimates fell short of requirements.

Maj. Gen. Charles G. Holle, special assistant to the Chief of Engineers, explained that Seaway planning covered so large a project that studies of some features had to be more general than would be true in a normal investigation and survey report. The planning funds, for example, could not cover the cost of making a definitive estimate for dredging in the Thousand Islands section. Such an estimate could be made, General Holle said, only after construction money became available for sweeping the channels and conducting some boring investigations.

Even then, the contract price for the Thousand Islands dredging was 31% higher than the government estimate and 200% higher than the amount included earlier in the agency's budget, Mr. Castle stated. Construction cost increases of this kind largely account for the $19 million ascribed to price escalation in the agency's revised estimates. Corporation accountants based their price escalation figure on actual experience for the 80% of the work awarded to contract and on a projection of the ENR Construction Cost Index to July 1, 1957, for the remainder. The projection shows a 22½% increase since December 1952.

Explanations of the cost increases don't satisfy congressmen completely, but there is no thought of refusing the requested rise in the corporation's debt limit. With good luck, the agency may be able to complete the U. S. portion of the Seaway under the new ceiling. If not, it will go back to Congress for more borrowing authority.

Administrator Castle assures the Congressional committees that the corporation will be able to pay off all its obligations to the Treasury in 50 years, with interest, on the basis of toll rates that will attract capacity traffic to the Seaway. However, some shippers, including those in the Great Lakes-St. Lawrence Association that lobbied for the Seaway, are warning Congress that high construction costs could lead to high tolls that would cut down use of the Seaway and defeat its purpose.

Wire Mesh Fences Protect Drivers

Tumbling rocks in the past two years have hit several cars traveling Hawaii's Nuuanu Pali highway between Honolulu and Windward Oahu. The Territorial Highway Department now has erected wire mesh fences to help protect against the danger. Though several steel auto tops have been punctured in the past slides no one, fortunately, has been seriously hurt.

Bucyrus-Eries Cut Downtime On Tight-Schedule Road Jobs

To keep those jobs moving fast, let the low-maintenance features of Bucyrus-Erie convertible excavators go to work for you. These machines are designed for tough going, and their stamina has been proved by years of satisfying performance in the field.

On the Boston Southeast Expressway now nearing completion, a Bucyrus-Erie 3-yd. 71-B, 2-yd. 51-B, 1½-yd. 38-B, and three ¾-yd. 22-Bs were chosen to move some 1,800,000 yards of granite mixed with dirt and other stone. This assignment called for plenty of power, plenty of strength . . . and the ability to keep moving on schedule.

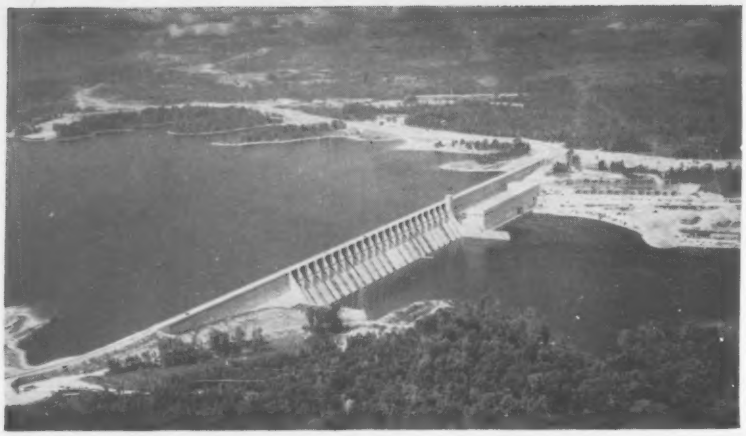
Even on such rugged sections as the one pictured above where the 71-B loads out heavy granite rocks near East Milton, the Bucyrus-Eries maintained a good record. It's the sort of performance that has built confidence: The owner of these machines has used Bucyrus-Eries since the days they were operated by steam.

For additional information on Bucyrus-Erie convertible excavators from ⅜- to 4-cu. yds., see your nearby distributor soon. Find out why Bucyrus-Eries are first choice for construction jobs all over the world. 310E56

Bonus Quality Castings used in Bucyrus-Erie machines are produced in the company's own foundries where careful supervision holds them to highest standards. Workmen are shown here pouring steel castings at the South Milwaukee plant.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



At John H. Kerr Dam powerhouse . . .

. . . Centralized controls cost but $80,000

Change Saves $32,000 a Year

At the beginning of this year, $80,000 was spent to bring practically all controls and recorders for the seven generating units at John H. Kerr Dam—formerly called Boggs Island Dam—in Virginia, into one big switchboard room. Immediately, eight jobs totaling about $32,000 per year were eliminated—the men to be absorbed elsewhere. Now, operating personnel for the 204,000 kw capacity powerhouse is but two men per shift.

The changeover at the Corps of Engineers' multipurpose Roanoke River project, completed in 1952 at a cost of $87 million, follows a trend in extensive use of automatic controls in place of manual ones and in centering the controls and recording devices at a point in the powerhouse to effect remote control.

At John Kerr Dam, each generator switchboard has had a number of new devices added—turbine throttle and oilers, for example. Continuous flow recorders, another trend, have been brought up to the switchboard room, along with temperature recorders. All these are under the eyes of two men who, working from the switchboard of any one unit, can observe and correct all necessary operations of that unit.

Cost of the automation and centralizing should easily pay for itself in saved salaries in about 2½ years—not to mention the convenience and safety of the new system. Changeover was directed by R. C. Wehry, powerhouse superintendent, following Norfolk District design specifications.

ASCE Group Seeks Standard For Pipeline Crossings

A definite step looking to development of a standard for pipeline crossings has been announced by the American Society of Civil Engineers.

ASCE's 25-man Committee on Pipeline Crossings of Railroads and Highways, set up by the recently established Pipeline Division, includes representatives of railroads, the US Bureau of Public Roads, the Federal Power Commission, pipeline groups, gas and petroleum organizations and others.

Announcing the committee's purposes, Chairman J. E. Thompson said: "The need for a standard has become more urgent as longer and larger diameter pipelines are built." One division of a railroad may, and sometimes does have, different specifications for the same class of road as another division, and many highway departments are adopting codes which vary for the same class of construction.

"With the many different specifications now in use, it has been increasingly difficult for pipeline companies to obtain the proper materials and design for each individual condition. Pipeline materials often must be ordered two years in advance of construction and many times before crossing permit data is available. A properly developed standard could greatly facilitate this type of work and assure the railroad or highway department of a safe, well engineered crossing."

When the tentative specification prepared by the ASCE Committee is acceptable to its Committee membership, it will be submitted to the American Standards Association and if approved by that body, will be adopted as a standard code for pipeline under crossings of railroads and highways.

Armco Offers Scholarships To Stir Highway Interest

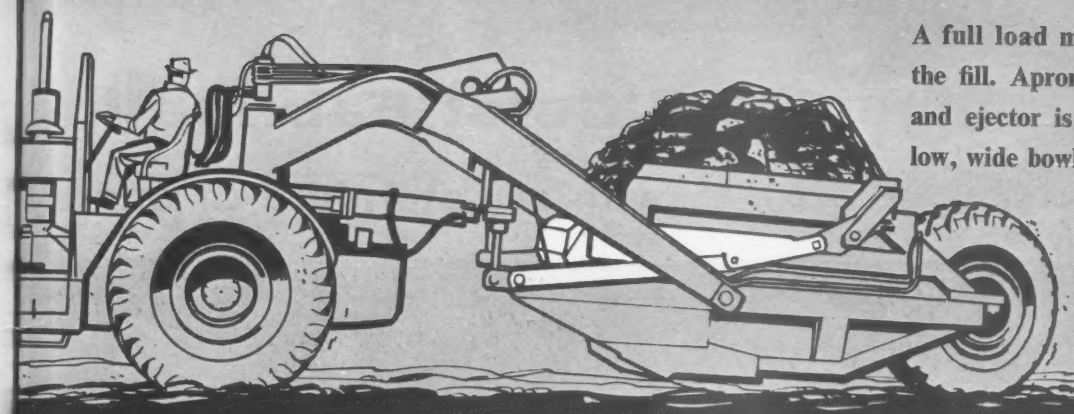
Armco Drainage & Metal Products, Inc., Middletown, Ohio, is offering two new experimental travel-and-learn scholarships for civil engineering students.

The students will study at highway and railroad construction projects throughout the country. Scholarship winners will each get $500 and an all-expenses-paid six week's tour of major construction sites.

Armco's president, S. R. Ives said the unusual scholarships will be offered in an effort to interest more civil engineering students in the highway construction field.

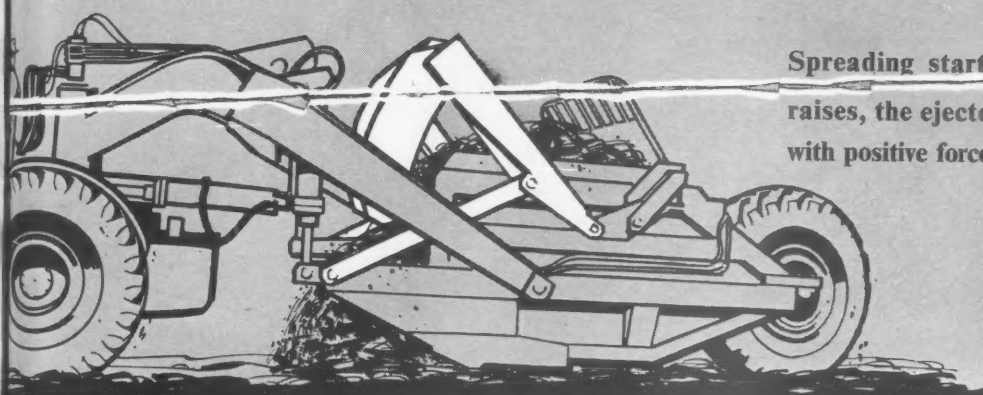
Colleges participating in the program are: Pennsylvania State University, University of California, North Carolina State College, University of Illinois, Iowa State College, University of Kansas, University of Minnesota, Washington State College, University of Colorado and the University of Oklahoma.

One student from each school will be selected on the basis of scholarship, personality, interest in his field of study and on an engineering report dealing with current problems in highway drainage and construction. Each of the 10 finalists will receive $200 and a trip to Armco Drainage headquarters at Middletown for personal interviews and final judging.



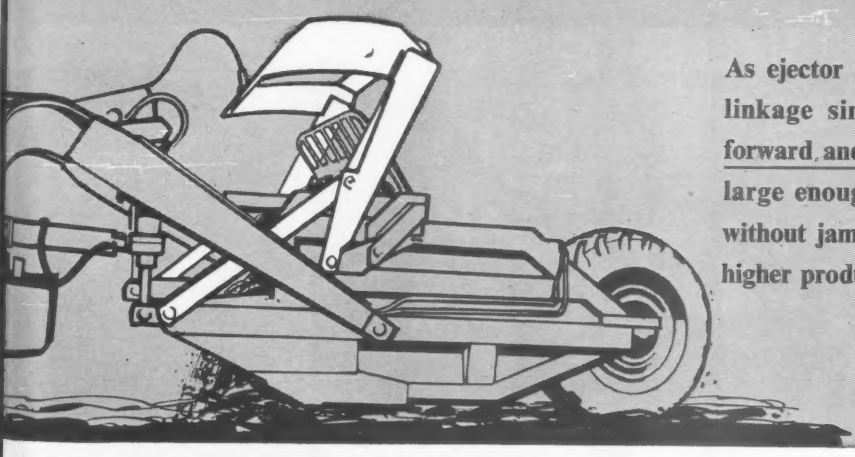
A full load moves on to the fill. Apron is closed, and ejector is at rear of low, wide bowl.

How Allis-Chalmers' patented 3-point scraper linkage



Spreading starts. As the apron raises, the ejector moves forward with positive force, accurate control.

assures fast, clean, controlled spreading of any material



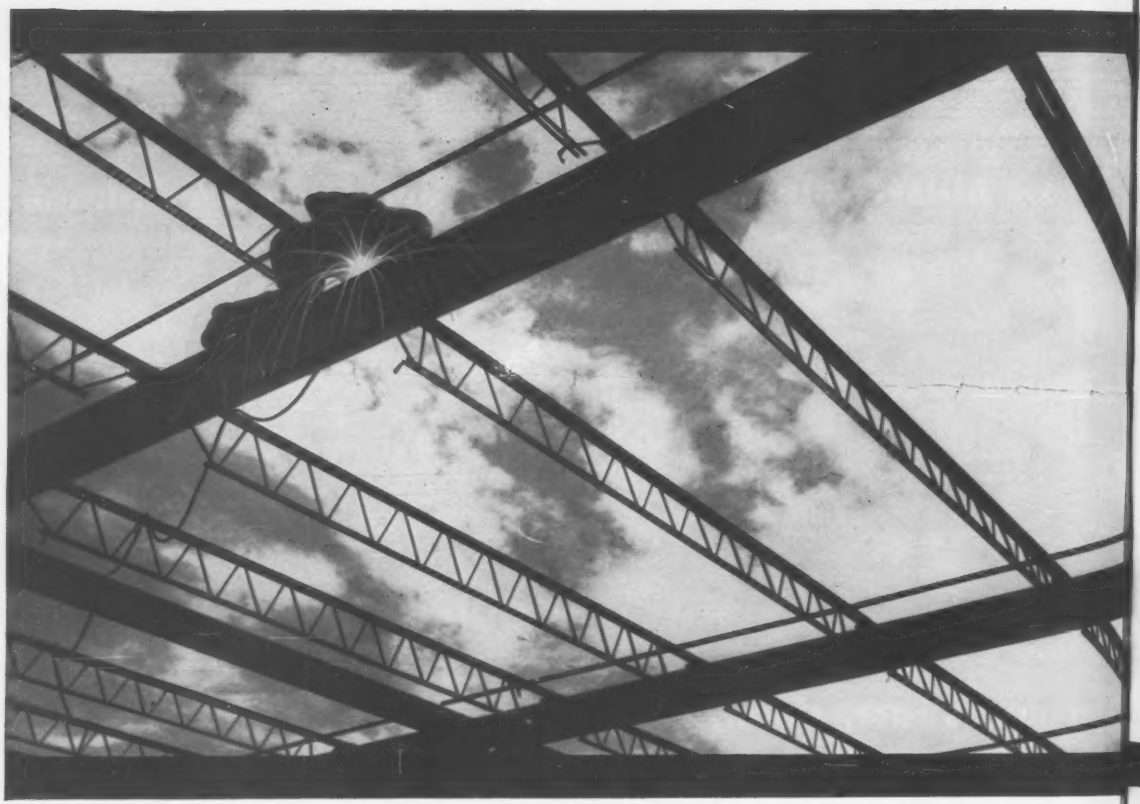
As ejector moves toward cutting edge, linkage simultaneously moves apron forward and upward, providing opening large enough to let any load fall free without jamming. Result: faster cycles, higher production, more profit!

Only your nearby Allis-Chalmers dealer can offer you this important advantage. See it demonstrated now . . . on either motor or pull-type scrapers. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS *Engineering in Action*

6 Steel Joist Fabricating

...with *one* standard of quality



Shopping Center, Panorama City, Los Angeles, Calif. / Architect: Welton Becket & Associates / Contractor: L. C. Dunn, Inc. / Structural Engineer: Brandow & Johnston.

Remington Rand Building, Chicago, Ill. Architect: Harry O. Bartlett / Contractor: J. L. Simmons Co. / Structural Engineer: John W. Emig.

Meadow Brook National Bank Building, West Hempstead, L.I., N.Y. / Architect: W. Thomas Schaardt / Contractor: John J. Dixon Co., Inc. / Structural Engineer: Albert Roselli.

Plants from Coast to Coast

and service for all

There are ways you can meet your own demand for quality building products—for prompt delivery—for dependability in suppliers.

In the field of Open-Web Steel Joists, for instance, all you need do is rely on Ceco. For Ceco answers your demands with a single standard of joist quality the country over. *Only Ceco fabricates Open-Web Steel Joists in six plants located coast to coast to assure prompt and economical delivery anywhere.* Moreover—wherever your office and wherever the job—you can count on the practical knowledge and advice of Ceco executive engineers.

Ceco's Quality Control ensures the highest manufacturing standards. All joists must pass Ceco's own rigid manufacturing and inspection requirements—also meet all design and quality standards of the *Steel Joist Institute.*

So, specify Ceco Open-Web Steel Joists. They can be quickly installed in any kind of weather. They provide space for pipes, ducts and conduit. And they give you light-weight, safe, permanent floor and roof construction, at a cost to meet budgets. Furthermore, our new Electro-Channel Joists offer the most economical underfloor electrical flexibility for steel frame construction . . . they function as both structural members and underfloor electrical distribution ducts. Ceco Steel Products Corporation—general offices: 5601 West 26th Street, Chicago 50, Illinois—offices, warehouses and fabricating plants in principal cities—consult Sweet's catalogs or your telephone directory for the address of the Ceco office nearest to you.

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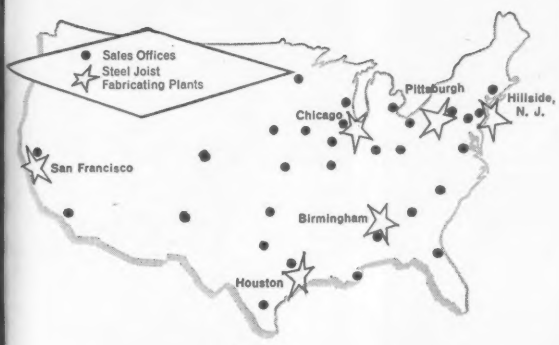


This map shows the coast to coast network of Ceco Steel Joist fabricating plants and sales offices.

CECO STEEL PRODUCTS CORPORATION
5601 West 26th Street, Chicago 50, Illinois

Gentlemen:

Please send me technical data for the following Ceco Products:

___Shortspan Open-Web Steel Joists
___Longspan Open-Web Steel Joists
___Electro-Channel Open-Web Steel Joists
___Truss-Beams
___Steel Roof Deck

Name_____

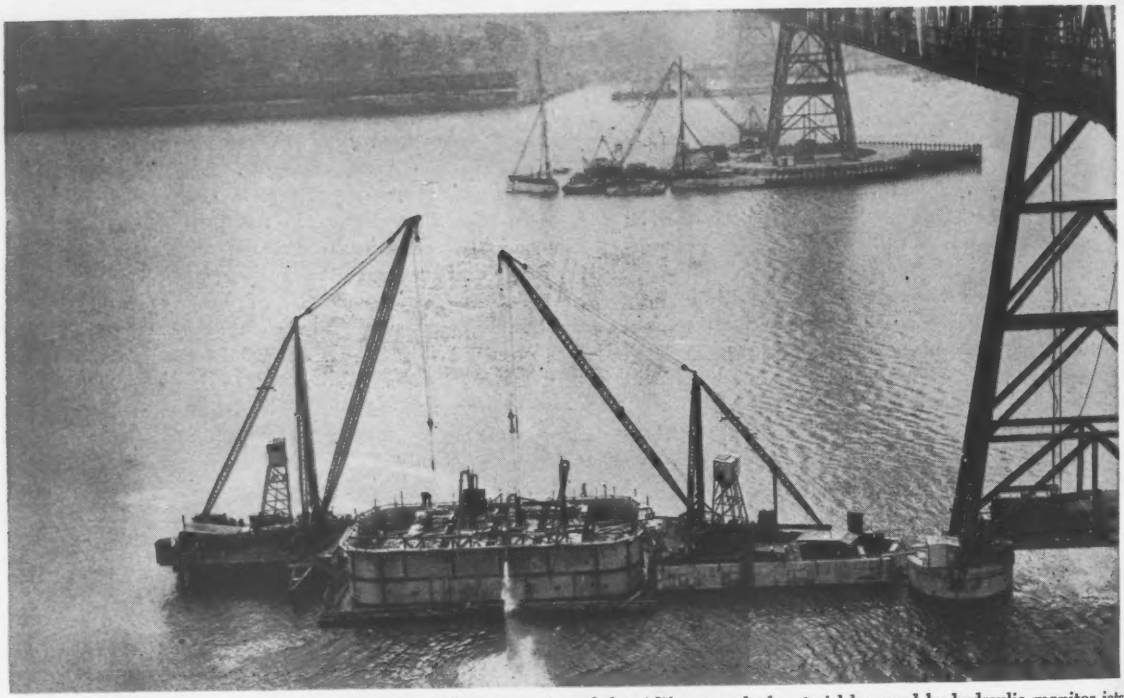
Address_____

City_____State_____

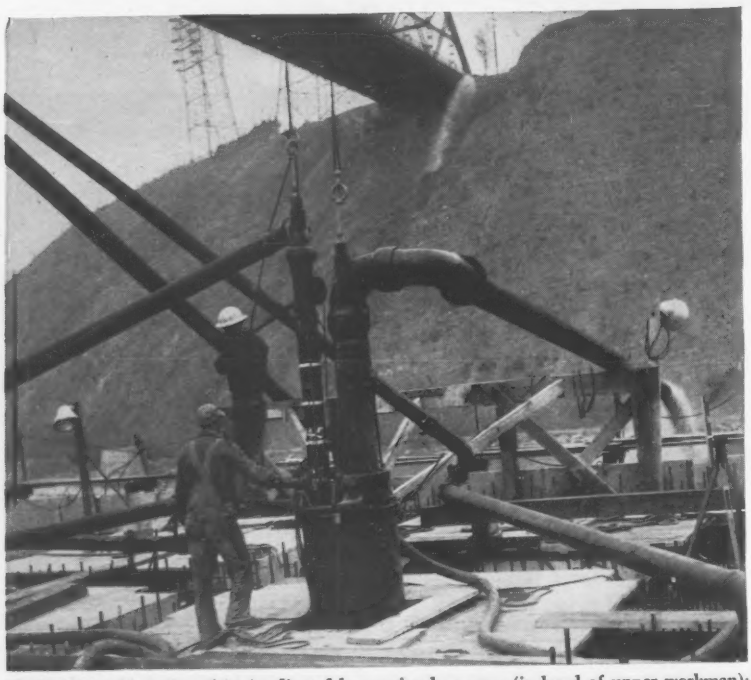
ENR

Contractor reaches deep into bag of tricks for new ideas on deep water, heavy foundation job

Hydraulic



GOING DOWN: Open caisson for Carquinez Straits bridge pier is sunk by airlift removal of material loosened by hydraulic monitor jets. Mechanism is mounted in four center cells of the 18 celled caisson.



VERTICAL: Direction of jet is adjusted by moving lever arm (in hand of upper workman); position of jet and airlift is changed by derrick.

HORIZONTAL: Jet nozzle has universal joint mounting.

Jets Sink Carquinez Caissons

Hydraulic monitors mounted under open caissons are loosening sand, gravel and mud so the huge Carquinez Bridge foundations can reach bedrock. The material is removed by air lift pumps.

The jet excavation technique is not the only construction scheme applied for the first time to open caisson work at Carquinez. Contractors—a joint venture of Mason & Hanger-Silas Mason Co., Inc., and F. S. Rolandi, Jr., Inc. —are using precast concrete panels for exterior wall forms; panels become part of the final wall. A novel concrete distributor feeds mix to the "egg-crate" walls. And underwater rock blasting was accomplished by shaped charges.

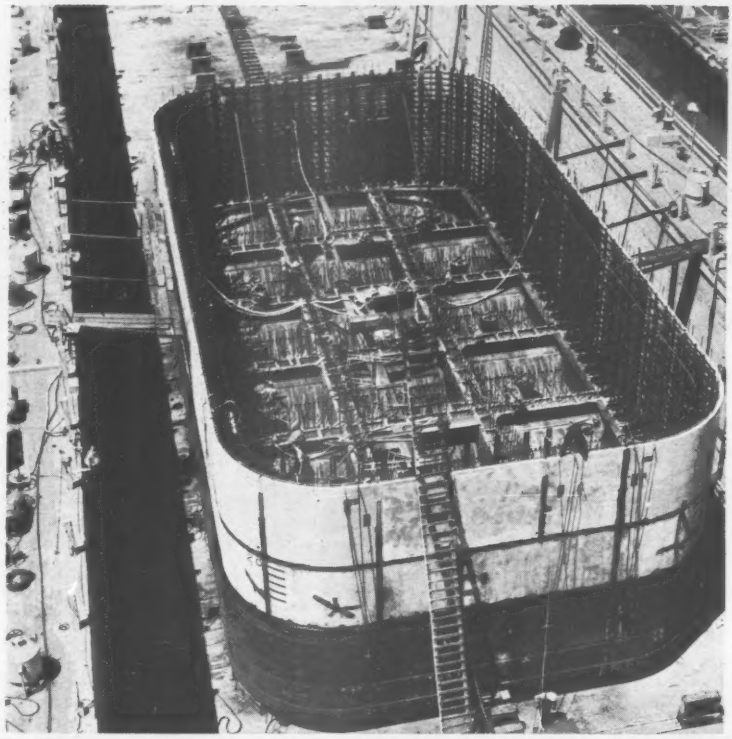
The foundations will support a new cantilever crossing of Carquinez Straits, an arm of San Francisco Bay some 40 miles northeast of the city. The bridge parallels an existing bridge. Both structures have two 1,100 ft long cantilever spans, two 500 ft long side spans, and a 150 ft mid-crossing tower span. When the new bridge as completed in 1959, it—together with approach freeways under construction—will remove the most critical traffic bottleneck on the heavily traveled U. S. 40 between San Francisco and Sacramento (ENR Dec. 15, 1955, p. 45). Construction is administered by the California Division of Highways for the California Toll Bridge Authority.

• **Three big caissons**—There are three identical open caissons on the job. Each will be 53 ft wide by 102¼ ft long. They are being sunk through about 90 ft of water and 45 ft of mud, sand and gravel. Total height of the caissons will be nearly 150 ft. First caisson reached rock after penetrating only 31 ft of material.

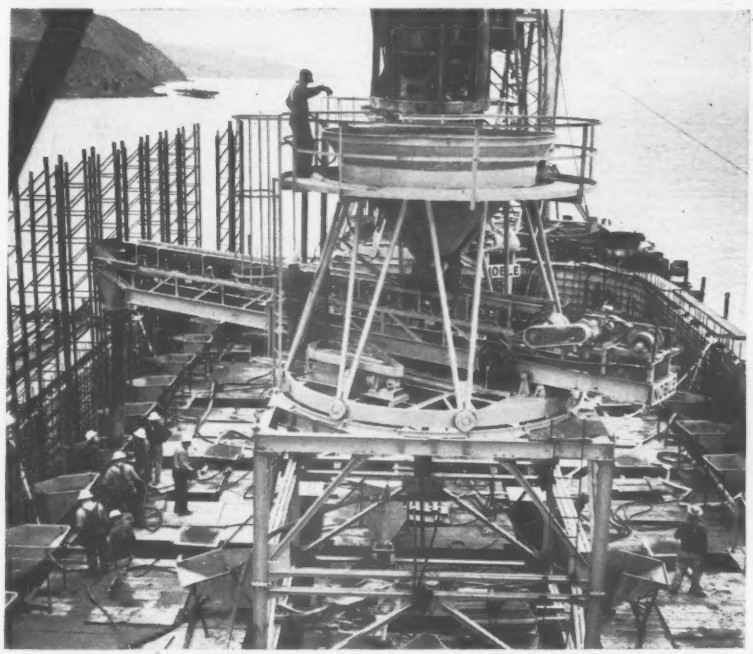
One caisson supports the north tower and the two will support the center tower. The south tower is being built on a pier constructed inside a sheetpile cofferdam. It is in much shallower water than the other towers.

The north tower caisson has reached bedrock. And work is well along on concreting one of the two mid-crossing caissons. Thus, this article describes the procedure used on the north tower caisson. Work on the other two will follow the pattern of the first.

Use of open caissons for bridge foundations is certainly not new. But there is always an element of excitement in floating such a huge mass of concrete and steel, towing it into position, anchoring it against treacherous currents, and slowly building up its walls to impose the necessary load to



DRYDOCK: Concrete wall panels were added to the steel cutting edge in the drydock; initial reinforcing was welded into place.



PLACING: Concrete distributor has conveyor belt with 30 ft reach to feed the mix into the wall forms. Distributor is air powered.

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. . . Carquinez Bridge: Caissons Floated to Site

sink it into the underlying formation. And such foundations are rare enough so that each designer and each contractor does things just a little differently.

• **Built in shipyard**—The 53 ft by 102½ ft Carquinez caissons have 18 interior cells, each cell, 14 ft square. Corner cells are rounded to a 9 ft inside radius. Most of the caisson is concrete with interior walls 30 in. thick and exterior walls 3 ft thick.

The bottom 12 ft is a steel cutting edge assembly. Mason-Hanger-Rolandi subcontracted fabrication of the initial portion of each caisson to the shipbuilding division of Bethlehem Pacific Coast Steel Corp. The cutting-edge parts of the caissons were assembled in a floating drydock at Bethlehem's San Francisco shipyard. Some 20 ft of concrete wall—partly full thickness and partly just precast panels—were added to provide sufficient freeboard for the tow to Carquinez.

Each caisson cell is sealed by a false bottom that is an inverted dome of laminated timbers. These timber seals include a 30 in. dia steel pipe dredging well for access to the underpart of the caisson.

The initial caisson assembly weighed some 1,600 tons and included 12 ft of steel cutting edge, 10 ft of solid concrete wall and 10 ft of 4 in. thick wall panels. In a floating condition the caisson drew some 15 ft of water and had 17 ft of freeboard.

Before positioning the caisson at the bridge site, the contractor constructed most of the elements of the fender system. The fenders are based on 24 in. dia steel pipe piles filled with concrete after driving. The piles are as much as 150 ft long. The contractor used the fender system as an aid in anchoring the floating caissons.

One problem faced by the contractor in the initial stages was vibration of the pipe piles before they were filled with concrete. Vortex of the current at certain velocities has the same vibration as the natural period of the pipe. To overcome this vibration tendency required substantial bracing of the piles before concreting.

Anchorage for the north caisson includes 16 concrete anchors weighing 25 tons each. Plan was to jet the anchors down into the silty formation by use of seven firehouse nozzles through which water at 300 psi was forced. This didn't prove to be enough to move the stiff formation and a big airlift was needed to get the anchors into place. At some spots where the bottom formation was too hard for even the airlift to penetrate, position was held by sinking old barges on top of the anchors.

In general, cables from the anchors are run through a sheave near the bottom of the caisson and attached near the top. The top connection was moved up as the caisson walls were built up. This two point attachment afforded positive control against any overturning tendency.

• **Precast wall forms**—Once anchored securely in position, the caisson was sunk through the 90 ft of water depth by building up the concrete walls to add weight. One important feature of this concreting operation is the use of 4 in. precast concrete panels as exterior wall forms. These panels are supported by small steel trusses cantilevered up from the previously poured concrete. The trusses become part of the wall reinforcing.

Joints between panels are sealed by a 6 in. width of glass fiber reinforced tape coated with a thick plastic paint. A bond is thus formed between the tape and the concrete that would break the concrete before it broke the tape.

There are several distinct advantages of the precast panel procedure. It acts as an outside form, replacing awkward and hard-to-handle forms. Because there are no outside forms to remove, no finishing or patching of the exterior walls is necessary. Finally, the panels form a watertight shell that temporarily increases the flotation qualities of the caisson while it is towed to the site and during positioning and sinking operations.

Forms for the caisson cells are plywood faced, steel supported assemblies. Screwjacks at the corners collapse and expand the form assemblies to facilitate form placing and removal. The plywood has a glass plastic coating that permits the forms to be reused 13 or 14 times—which is the number of pours required to pour the walls of one caisson. No form oil is needed.

The forms are in the shape of a box 12 ft high. As each wall pour is a 10 ft lift, this permits a 2 ft overlap for fastening purposes with the previously poured wall.

• **New concrete distributor**—Concrete is fed into the caisson walls by a pair of unique air-powered distributors that feature 30 ft reach conveyor belts. The distributors are platform mounted and can be rotated through 360 degrees by air power. Concrete is fed into 9 cu yd hoppers that in turn feed the conveyor belts through air-operated gates. Reach of the conveyor can be altered by another air-operated device. Speed of the concreting is controlled by the hopper gate opening and by the conveyor belt speed. The 3 ft wide conveyor belt feeds a nylon cord, vinyl

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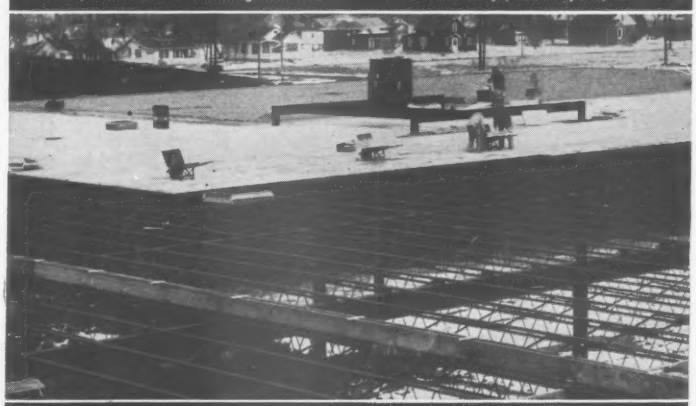

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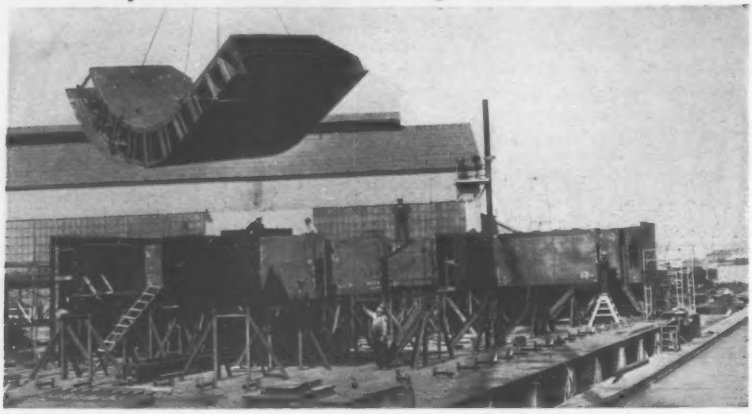
. . . Carquinez: Novel Concreting Methods



CUTTER: Caisson cutting edge was built up of steel plates and assembled at a San Francisco shipyard. It formed base for concrete sidewalls.

plastic coated elephant trunk. The 36,000 lb distributor assemblies are set on an adjacent barge while form moving operations are in process.

Air power for the distributors comes from a 650 cfm compressor driven by an electric motor, fed by a 2,300 v power cable brought to the caisson area over the existing bridge. Most of the equipment on the caisson construction is electrically driven to minimize necessity of hauling fuel. One of the two 20 ton derricks servicing the caisson is diesel powered—the other is electric.

Concrete is brought to the job in barges with special compartments for concrete buckets. Each of the three barges hauls six buckets to the job and has two empty compartments. Two buckets are left suspended on the derricks while the barge is returned for refill. The 4 cu yd buckets are filled to only 3 cu yd of concrete because this makes for faster handling.

Concrete is batched and mixed at an installation that the contractor has set up on the south shore. The plant has two 3 cu yd mixers and is capable of producing 120 cu yd an hour. In actual operation on the 690 cu yd wall pours, some 90 cu yd an hour is placed in the forms. This rate is controlled by the barge haul operations.

With a two minute mix time, six buckets on the barge can be charged in as many minutes. The concrete plant has telescopic chutes that can be extended or retracted as the tide rises and falls.

Limited room was available to stockpile aggregates. The batch plant has aggregate capacity in its bins for about 300 cu yd of concrete. Remainder of the storage capacity is provided by two rail sidings with enough additional storage capacity for 700 cu yd more of concrete. Aggregate is fed from hopper cars to the bins by a conveyor that starts in an under-track tunnel.

The wall pouring was on a 4 day cycle. The day following a pour, reinforcing steel, trusses and precast panels were set. A day later the forms would be moved. This usually took two days which meant that a pour was made every fourth day. Concreting was a one-shift operation.

• **Jet action excavation** — Concreting continued on the first caisson until it penetrated well into the underlying mud under its own weight. Then the concreting equipment was removed and jet excavating equipment was installed.

In a week's initial operation, the caisson was sunk an additional 16.8 ft into the underlying formation. At this stage, what might be the most critical part of the caisson construction was completed. The huge foundation was no longer a floating object but instead was supported on its base.

Concreting was resumed to build the walls up to where they would be above water level when the caisson finally reached firm foundation. Then the jetting was resumed so the foundation could be sunk 14 ft more to bedrock.

The jets are simply hydraulic monitors such as are used for sluicing rockfill dams. Nozzles are so mounted as to permit directing the jet in any direction. The jet is fed by a 6 in. pipe. Water is provided by two 1,500 gpm pumps capable of developing 350 psi. With a 1½ in. nozzle opening the underwater stream is effective at a 30 ft radius.

The jet and airlift assembly is mounted inside a 30 in. pipe attached to the dredging well in the false bottom of a caisson cell. All of the major excavation for the first caisson has been accomplished by using four such assemblies mounted in the four interior cells of the caisson.

Material is removed by 10 in. dia airlift pipes. Each airlift needs 400 cfm for successful operation. Capacity is available to develop about 1,800 cfm of air.

Air supply is fed to near the tip of the airlift by a 2½ in. pipe. Air is introduced by means of a manifold that insures even distribution of air around the circumference of the 10 in. airlift pipe. By this means a flow of 10 fps is developed in the airlift which is capable of moving a 2½ in. rock.

• **A foot an hour**—In operation, the jets are directed to move underlying materials from the edges to the center of the caisson. Operator skill is developed to keep the discharge as dirty as possible—this means maximum removal of material. In an easily moved formation, the caisson was sunk as much as 1 ft in an 8 hr shift.

The caisson can be maneuvered a few inches by proper direction of the jets. This is important in meeting the tolerance for final caisson location which is 1 ft in 100 ft of caisson height.

Advantage of the jetting operation is that the false bottoms need not be removed until the caisson is very nearly to its final position. This means that a constant pressure of about 5 tons per square foot is kept on the material below the caisson. (Some of the caisson cells are partly flooded with water to provide additional weight.) Maintaining pressure on the bottom helps to assure positive control of the caisson. By using the jets to gradually relieve pressure, movement of the caisson can be controlled with maximum safety.

At present, the first caisson has reached bedrock. False bottoms have been broken out for removal of bottom material by clamshell as well as jets and air lift. Rock encountered at the bottom was very hard and sloped from north to south. The caisson leaned some 4 ft to the south as a result. This made it necessary to lower the north side about 2 ft through rock. Shaped charges were used to break up the rock for this purpose.

• **Rock blasting**—The shaped charges are made by packing 6 to 7 lb of 60% gelatin dynamite into a 6 in. length of 6 in. pipe capped at the upper end. The explosive charge is shaped by a sheet metal cone placed in the bottom of the pipe with the open end of the cone down. The charge is packed between the sheet metal and the pipe.

Result is that the explosive wave forms a directed jet that concentrates its force on the rock to be broken. Short legs hold the entire charge assembly up from the rock for better effect.

To prevent damage to the caisson, a limited number of the charges were

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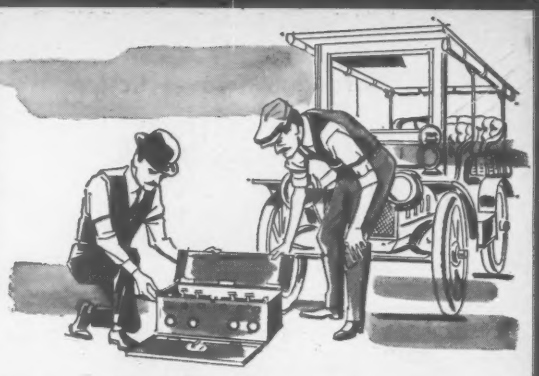
(NO. 2 IN A SERIES)



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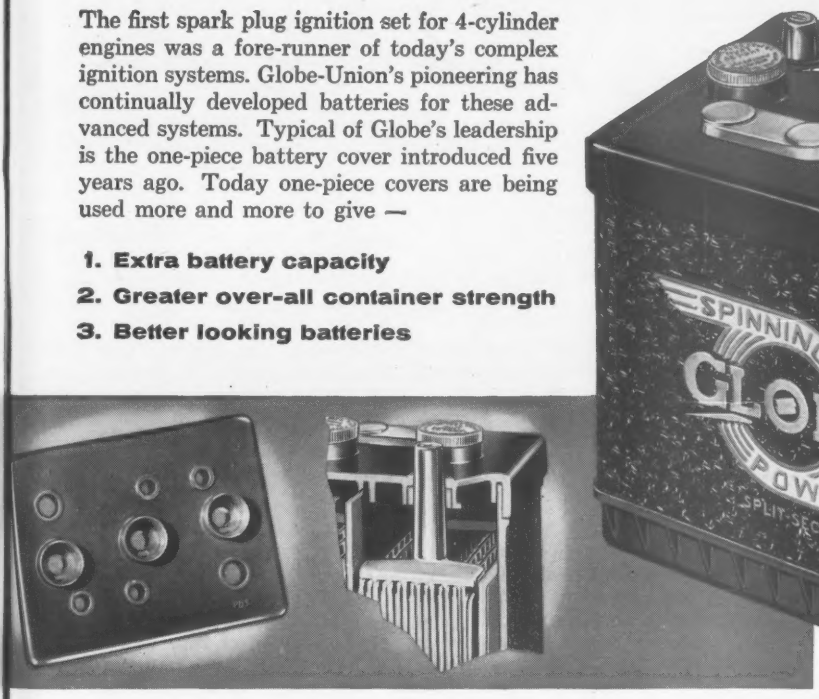

• Note unitized one-piece cover-case construction — brute for strength, less susceptible to damage in handling or distortion from extreme under-the-hood heat — resists vibration from road shock, protects vital battery parts — unharmed by oil and grease • Weld-sealed to case, having tongue and groove joint, triple sealed into one inseparable unit — cell partitions and container are strengthened, reinforced like a battleship to withstand heat and abuse • Another milestone in power — another first for Globe!

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Carquinez: South Pier Requires Cofferdam

BRACING: Floating cranes lower cofferdam brazing truss into position. This assembly was used to support sheet pile for south pier cofferdam.

used at any one time. The units were placed by a diver on rock that he felt needed breaking.

Charges were kept 3 or 4 ft from the caisson wall and were spaced about 7 ft apart. Nine separate detonation of six charges each were needed to break up the rock that caused the caisson to tilt thus permitting the huge unit to seat properly.

When the bottom is finally cleared, all that remains is the pouring of a 25 or 30 ft thick tremie plug. This plug will be poured in three increments. Vertical bulkheads will be formed by use of steel roof decking material. Advantage with this system is that the tremie pours will then be limited to about 1,200 cu yd. Thus, the tremie concrete—with faster rise of the surface during pouring—is expected to be of better quality.

• **Cofferdam pier** — The south pier, which is already completed, required a 50 by 113 ft cofferdam.

The first step was driving of 14 in. H-piling through 50 ft of material to bedrock. The 261 piles required were driven with telescopic underwater leads.

Mounted on the H-piles is a 113 ton cofferdam bracing truss. This truss braces two sets of wales that prevent collapse of the sheet piling when the cofferdam is excavated.

The waling also acts as a guide for driving the 9x9 in., 38 lb. Z-shaped sheet piles.

The truss was fabricated at Bethlehem Pacific's Alameda works and assembled on a barge. After towing to the bridge site it was lifted into position by two barge cranes.

After excavation of the inside of the cofferdam, a 5 ft gravel blanket was poured to insulate the bottom against concrete seepage. Then the cofferdam was tremie sealed to a depth of 12 ft. Water was then pumped out and the exposed steel piling cut. This permitted the remainder of the reinforced concrete pier to be built to a height of 16 ft above the water line.

• **The men**—Leonard C. Hollister is project engineer on the Carquinez work for the California Division of Highways. Oscar Johnson is supervising resident engineer.

The bridge substructure work is being carried out under a $5,495,694 contract by Mason-Hanger-Rolandi.

Russell G. Cone is project manager for the joint venture, F. S. Rolandi, Jr., is assistant project manager, L. L. Snedden is project engineer and Ed Bowman is general superintendent.

Cone is a vice president of Mason & Hanger-Silas Mason Co., Inc., and was resident engineer on construction of the Golden Gate Bridge.

Rolandi is president of F. S. Rolandi, Jr., Inc.

Participating in planning the construction operations were R. L. Telford, executive vice president, Howard L. King, vice president and chief engineer, and Francis Donaldson, vice president of Mason & Hanger-Silas Mason Co., Inc.

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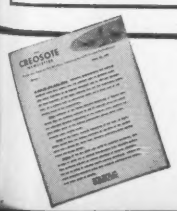

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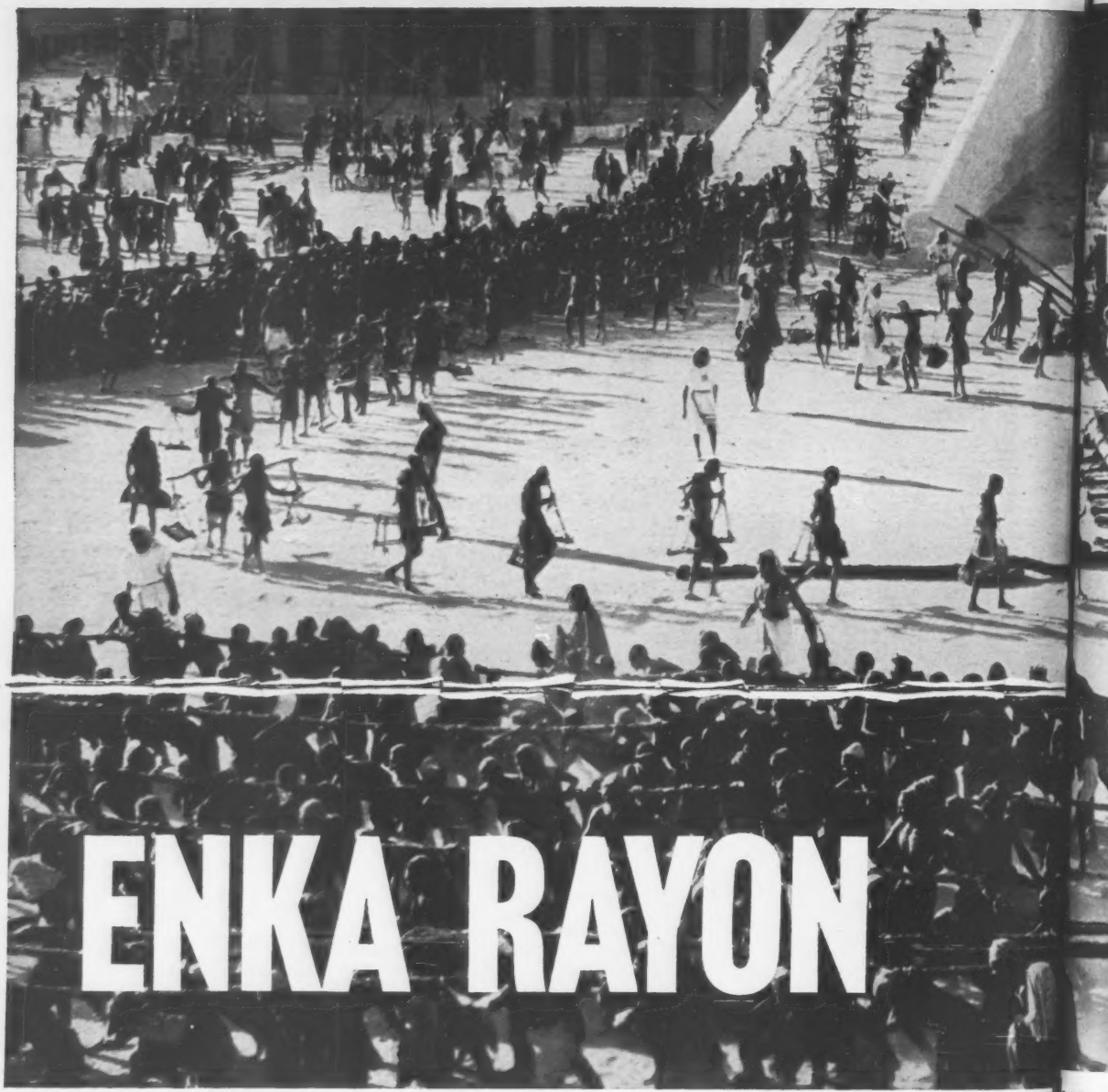

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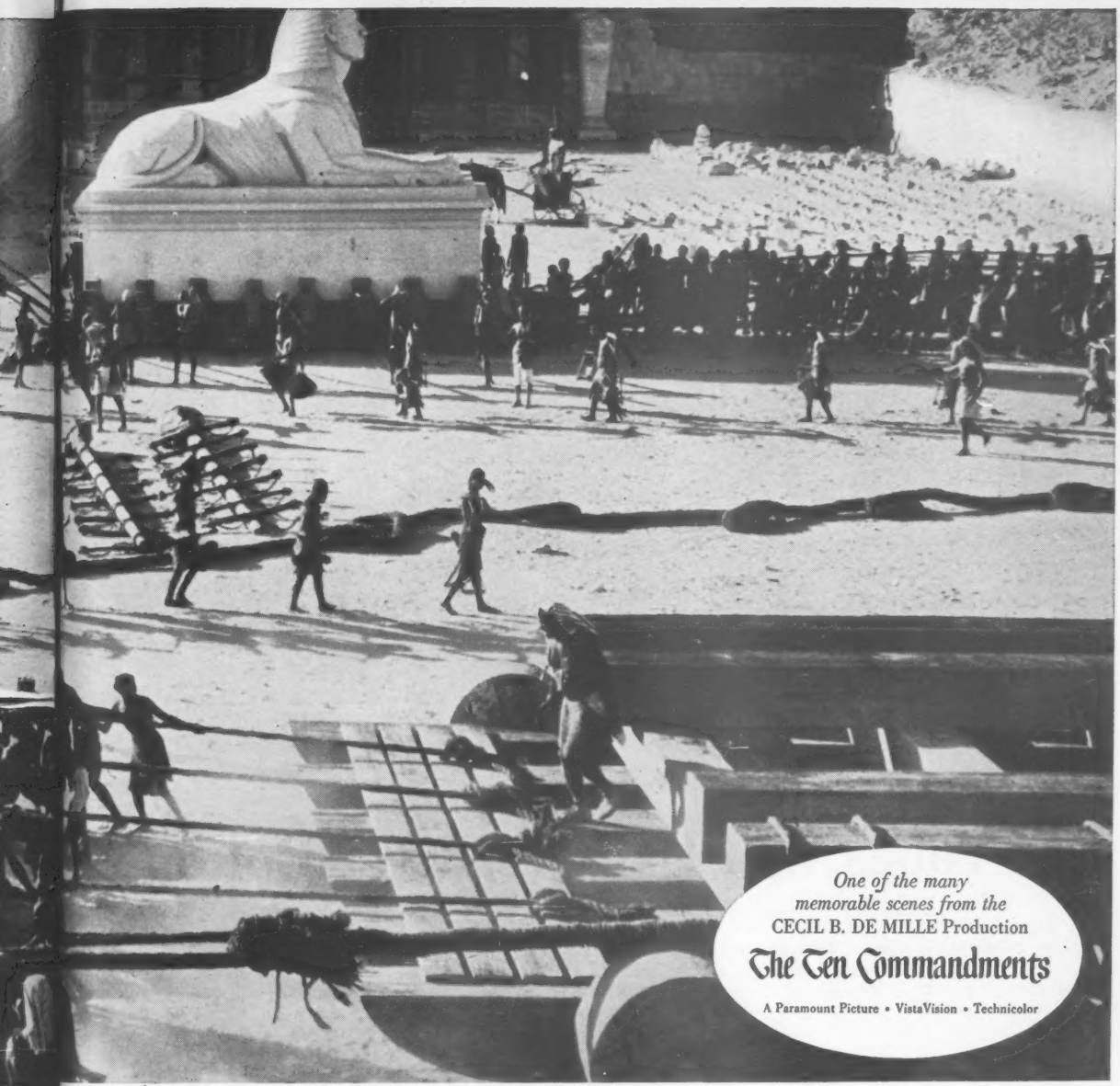
One of the many
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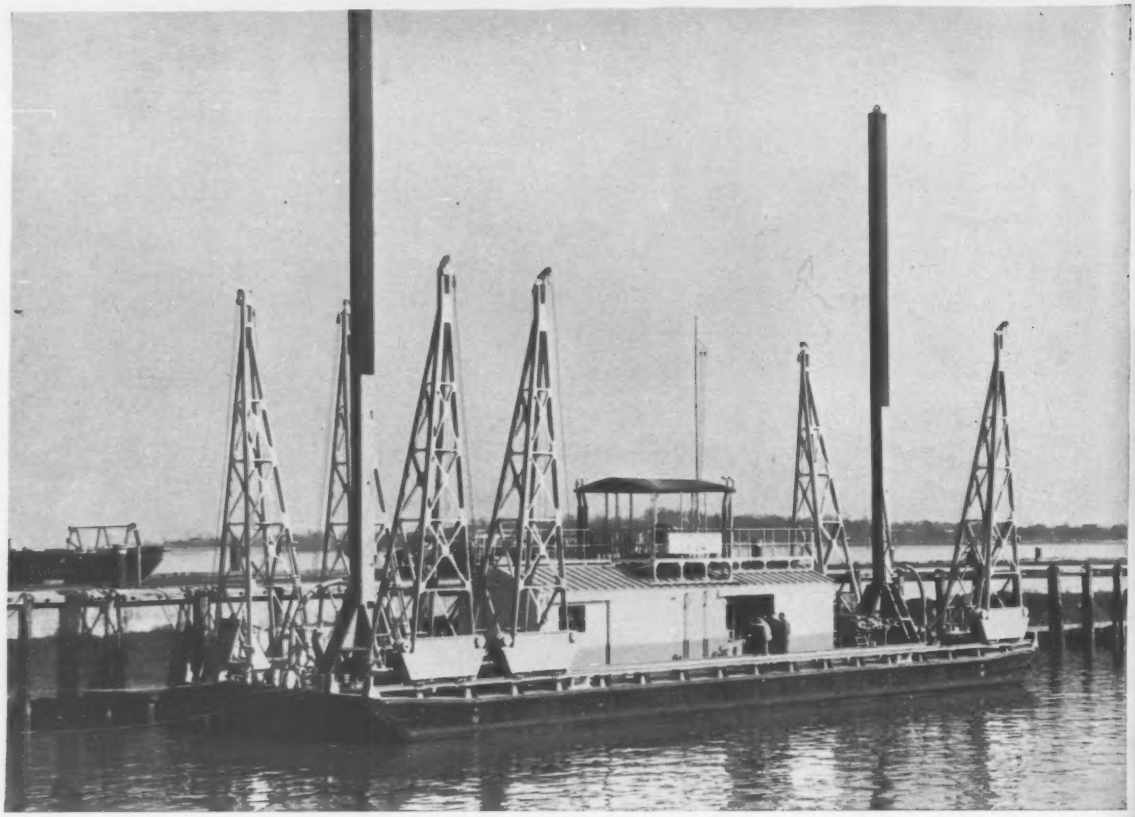


From this barge—before deepening of the Delaware begins—

Jet-Probes Will Explore River Bottom

To locate 1 million cu yd of rock in a 6 mile stretch of the upper Delaware River, 30,000 probings are being speedily and economically made by a floating battery of mechanized jet probers. The profile of the river bottom is needed in order to award rock removal contracts for deepening the river channel to 35 ft.

"Jet Probing Barge No. 1" is the unusual piece of equipment designed by the Philadelphia District, Corps of Engineers, to push the probe job through in the allotted time of six months. An ordinary steel deck barge, 100 ft long and 30 ft wide, has been converted into a rig that permits probing of 190 ft of line from one set-up.

The barge is fitted with six 37 ft high steel probing towers—three on each side—that mechanically handle the jet probers. The towers are mounted on rails running the length of the barge deck, allowing exploration along a 95 ft length of the barge.

Each probe consists of a 2 in. dia pipe with a jet nozzle at the tip. The probe is moved up and down by an air motor on each tower. Two diesel engines feed water to the probes and air to the motors. The six probes are run by a total of 22 men.

Contrasted to this is the conventional method of making probings in the river. Jet probes up to 50 ft long are manhandled from small scows equipped with hand winches for positioning on anchors; water supply is limited and nine men are needed to work each probe.

Another important feature of Jet Probing Barge No. 1 is that it is of sufficient size to be fixed on spuds at set-ups. Two 70 ft, 20x20 in. spuds, each weighing 17,000 lb, are dropped into the river bottom to maintain position even when breast anchor wires are slacked to permit passage of vessels. Whereas, with the small scow, slacked wires result in loss of position and partly completed probings. Often the scow actually has to be moved for the safety of equipment and crew. Time lost would run high, for at least two passages—by large sand and gravel tows, high-powered tugs and ocean-going ships—occur every hour in the channel, which is only 300 ft wide.

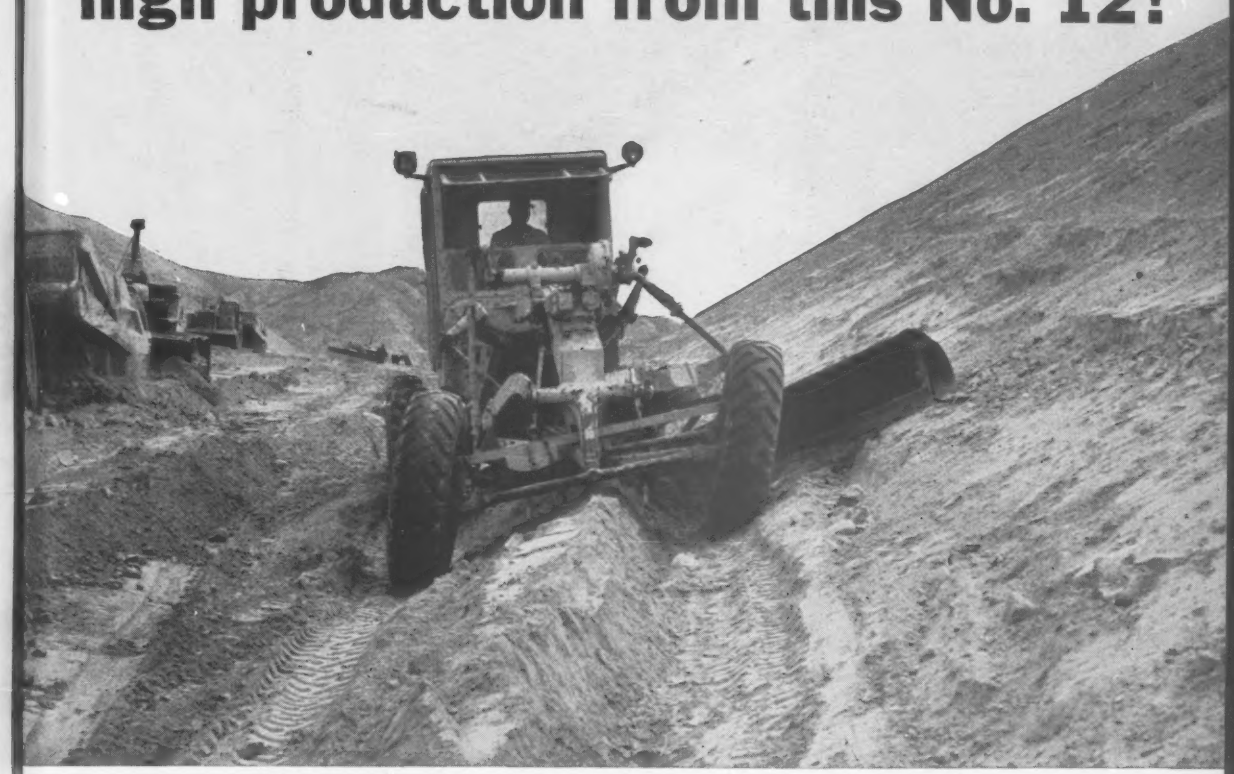
Power winches are used to move into new set-ups and position the jet barge. They winch up on anchor wires running to anchors downstream, upstream and each of the four quarters.

A lightly constructed house protects the engines and also provides shelter for the crew. A sextant observer's platform is atop the house.

The fitted barge is supplying the solution to one of the major problems—probings—in deepening the Delaware to 35 ft from Philadelphia to Trenton, a project estimated to cost $62 million. Dredging operations got underway in November, 1956. The barge will move to survey the rock areas in the 6 mile stretch in question after contractors have removed material—some 6 million cu yd—to within an average of 2 ft of the rock.

The barge conversion job was done by RTC Shipbuilding Corp., Camden, N. J., under a $164,982 contract awarded by Col. F. Clark, Jr., District Engineer.

Why Mr. Thorn expects and gets high production from this No. 12!



Besides bank sloping, this Cat No. 12 Motor Grader maintains haul roads for DW21s and DW10s on the 9.2-mile realignment of U. S. 91 near Mesquite, Nevada. Note D8 in background.

PAUL A. THORN

"We have owned Caterpillar products since 1927," says Paul A. Thorn, President of Thorn Construction Co., Inc., Springville, Utah. "We're firm believers in them because of economy, minimum down time, long life and constant engineering improvement. We also think that Caterpillar Dealer service is in a class by itself."

Speaking from 29 years of successful experience, Mr. Thorn now has a Caterpillar line-up that includes thirteen D8s, five DW21s, two DW10s, seven Diesel Engines, one Diesel Electric Set and six No. 12s. This No. 12, with 9999 hours on its hour meter, was part of the company's rugged yellow team on a 9.2-mile realignment of U. S. Highway 91. The contract involved moving 1,500,000 cu. yd. of dirt. Working 10 hours a day, 5 days a week, the No. 12 contributed its full share to money-making production.

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As good a machine as this "old" No. 12 has proved itself, there's even *more* work at *lower* cost with *less* down time built into the new No. 12. Constant engineering improvement is the reason. For example, the new No. 12 has an exclusive oil clutch that can operate up to 1500 hours without adjustment. New tubeless tires, now standard, save time and money by eliminating an estimated 80% of down time due to tube and flap repair and by providing longer tire life. These and other features add up to a new standard of grader performance!

Another point well worth considering: your Caterpillar Dealer backs you with prompt service whenever and wherever you need it. He has the trained mechanics and parts to do the job *fast* and *right*. See him for complete facts about the practical, advance-design features of the No. 12. Name the date—he'll be glad to demonstrate!

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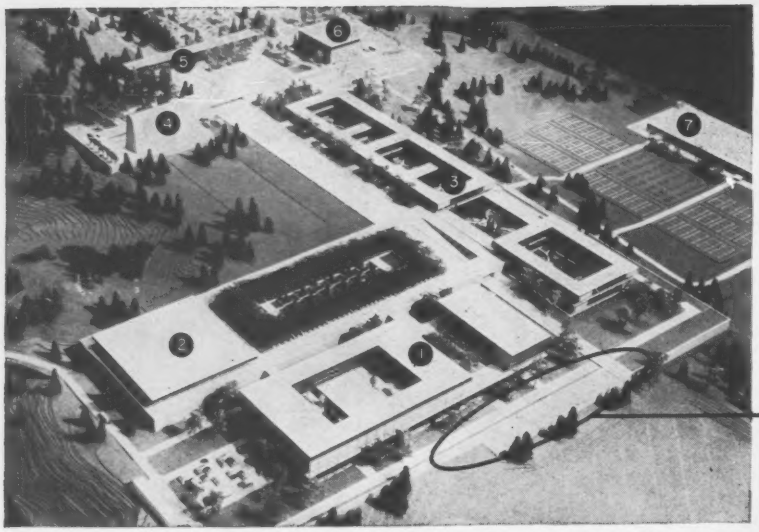


High retaining walls (arrow) at site of the Air Force Academy required painstaking study of foundations.

Academic area contains seven buildings: 1. Cadet Academic Building, 2. Cadet Dining Hall, 3. Cadet Quarters, 4. Chapel, 5. Administration Building, 6. Social Center and 7. Physical Education Building.

How Foundations for the Air Force Ac

Andrew J. Brown
Chief Structural Engineer

and

Wayne Teng
Assistant Chief Structural Engineer
Skidmore, Owings & Merrill
Chicago, Ill.

Tall retaining walls, heavy column loads and unexplored subsoil conditions called for extensive studies of the soils and foundations at the U. S. Air Force Academy in Colorado.

Located at the foot of the Colorado Front Range, 12 miles north of Colorado Springs, the site covers an area of 17,500 acres. High mesas and ridges extending from the foothills provide commanding locations for buildings.

On Lehman Mesa in the northwesterly portion of the site, the campus proper, or Academic Area, will be located. The seven buildings here form the major group at the academy and are the first to be constructed. Each will have a large floor area with the Cadet Quarters Building alone occupying four acres at the first floor level.

• **400 ton column loads**—There will be several hundred columns in each of the large buildings. A number of the columns will carry total loads of 800,000 lb, or 400 tons, each.

By extensive usage of retaining walls, the campus is being graded into three different levels. There will be about 10,000 lin ft of wall ranging in height up to 36 ft. Some of the walls are supported on man-made earth embankments 50 ft high. Their stability required thorough soil investigation.

• **Geological formation**—In ancient geological time the site of the academy was in an area forming a flat sea bottom. Thick beds of sedimentary rocks were deposited over granite formations. Near the end of the Cretaceous period, the sea bottom was lifted and folded, forming the Rocky Mountain Range which was later eroded and the present granite peaks were exposed.

A large amount of soil was eroded by water and transported by streams. When the streams reached flat slopes, soils and debris were unloaded along the stream beds, producing alluvial fans, deposits similar to river deltas. When these beds became filled, the streams changed their courses. In this fashion they left deposits with complex strata, pockets, lenses and trains.

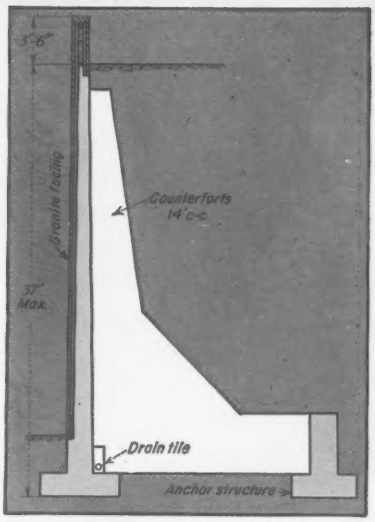
• **Soil profile**—A soil profile of the academy area shows that an ancient granite formation lies at a great depth. It has the same origin as the rocks of the Rocky Mountain peaks. Thick beds of sedimentary rock were deposited over this granite.

What is geologically considered as bedrock in the area consists of a series of sediments laid down in the Paleocene epoch—deposited by rivers, streams and small bodies of standing water—and known as Dawson Arkose. The soil overburden varies in depth from zero to 90 ft. It consists of sediment sand and gravel, with various amounts of silt and clay components.

Soil conditions in the area were revealed by test borings. Standard penetration borings were used in the majority of cases. In addition, several 6 in. dia Denison samples were taken to obtain undisturbed samples from the friable Dawson Arkose. The soils were classified in accordance with the Unified Soil Classification System. Petrographic examinations of the Dawson Arkose were also made by means of a microscope and showed sand grains in direct contact with one another.

Results of the tests indicated that an extremely dense mass of granular soil, located at reasonable depths is undoubtedly capable of supporting large footing loads.

A cost comparison indicated that a



COUNTERFORT WALL extending 35 ft above the ground was given greater stability by addition of an anchor structure at the end of the counterforts.

rc Academy Were Designed

reasonably deep drilled-in sub-pier would be more economical than a conventional spread footing and also have the advantage of not being affected by heavy flow of surface water due to rapid downpours.

The cementation between soil grains becomes nil on wetting and could be the cause of troublesome settlement. Therefore, it was decided to support the foundations on a soil of at least 100 blow resistance at a minimum depth of 20 ft below ground or floor level.

Caissons can be drilled and concreted with relatively simple equipment at great speed. Due to the tight construction schedule the speed became a major factor in selecting the type of foundation.

• **Load bearing tests**—To establish a design bearing pressure, large scale load-bearing tests were conducted by loading four piers at locations where different penetration resistances were encountered. A maximum test load of 800,000 lb was selected for two reasons: It was the maximum load considered practicable in this case, and it represented a great number of the column loads in three of the largest buildings.

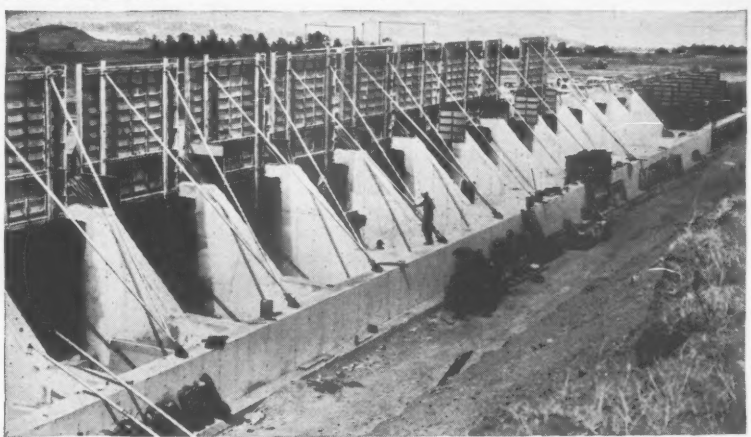
The tests were made primarily in accordance with ASTM standard procedures. Four hydraulic jacks applied the downward thrust on top of each test caisson, or sub-pier. The reaction of the hydraulic jacks was transmitted by a 36 in. steel beam to two anchor caissons.

The loads were maintained at constant magnitude between application of increments. The settlement of the test caisson was measured by two dial gages attached to the caisson on opposite sides. In addition, level readings were taken as a check.

The anchor caissons were located 7 ft each side of the test caisson. To eliminate the uplift effect of the anchor caissons against the test caisson, an annular space was provided between the test caisson and the soil. There was no sign of ground upheaval that would have indicated the upward movement of the anchor caissons.

The load-settlement curves show a fairly smooth change. In general the test results were deemed reliable and useful for establishing the design criteria.

To determine the accurate relative density, one boring was made adjacent to each test caisson. An examination of the borings and the penetration resistances disclosed a definite relationship



Symons Clamp & Mfg. Co. photo

WALL FORMS were prefabricated. At the 30 in. wide counterforts, a steel frame, faced with plywood, was specially made up, to fill the gaps between the large form panels. These forms were used in lieu of standard 2 ft panels and 6 in. fillers, saving on labor.

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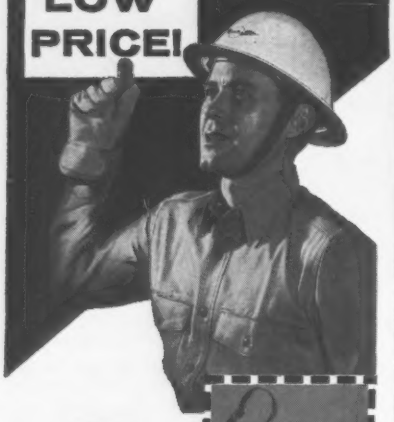

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. . . Foundation studies for high walls

TEST CAISSONS were subjected to a maximum load of 800,000 lb, applied by four hydraulic jacks. The jacks acted against a 36 in. steel beam tied down at each end.

between penetration resistance and the bearing values of the caissons; i.e., the bearing value increases rapidly with increasing penetration resistance.

• **Caisson test results**—Results of the caisson tests indicated that material having 20 blows resistance per foot penetration of the sampling spoon would have an ultimate bearing capacity of 48,000 psf. A factor of safety of 3.0 allows a design value of 16,000 psf with a corresponding settlement of $\frac{3}{8}$ in. Foundation material classified as 45 blow material would have an ultimate capacity of 64,000 psf, and a design value of 20,000 psf with a settlement of $\frac{5}{8}$ in. A third classification, 100 blow material, would have an ultimate capacity of 64,000 psf, with only $\frac{1}{4}$ in. settlement under a design load of 20,000 psf.

It was decided that the 100 blow material should be used for supporting all caissons, using 20,000 psf design pressure. All foundations will have a safety factor of three, and a maximum settlement of $\frac{1}{4}$ in. under full load.

• **Retaining wall design**—To design the most economical retaining walls and embankments with an adequate factor of safety, pertinent physical properties of all soils adjacent to them had to be determined. These properties were the unit weight and the angle of internal friction of the soils, including the compacted backfill, the natural soil and the embankment beneath the wall footings.

Due to the construction schedule, structural design and stability analysis had to be started before the completion of the soil tests. At that time the following values were assumed, based on the best information available:

Unit weight of soil 130 lb per cu ft.
Angle of internal friction 34 deg.
Coefficient of friction between base of wall and underlying soil 0.42.

Using these values, all retaining walls were designed with a minimum safety factor of 2.0 against sliding and overturning. The embankment supporting retaining walls was proportioned to maintain a safety factor of 1.5 against slope failure, pending further soil investigation.

• **Triaxial tests**—Undisturbed soil samples for triaxial tests were taken from open pits as well as by means of a 6 in. dia Denison sampler from the Dawson Arkose. Due to the lack of cohesive strength between soil grains, it was not feasible to carve any sample for triaxial compression tests. All such tests were made with disturbed samples compacted to the field density at the natural water content.

Test results of samples taken from soils having a penetration resistance of 30 to 40 blows per foot indicate an angle of internal friction ranging from 35 to 44.2 deg. The larger portion of the subsoil has a greater penetration resistance, hence, greater shear value.

To utilize the best material for the fill beneath and against the walls, a gradation survey was made of the cut material at the site. This survey showed there is a sufficient amount of material containing less than 10% fine grains passing the No. 200 sieve.

Samples of such material were tested in the field laboratory to determine the maximum modified Proctor density. They were also sent to a commercial laboratory and to the Colorado State Highway Department for determination of the unit weight and the angle of internal friction.

The tests made on samples compacted to 95% modified Proctor density gave the following values: Angle of internal friction, 43.0 to 44.2 deg, and unit dry weight, 130 to 134 lb per cu ft. Based on these values the coefficient

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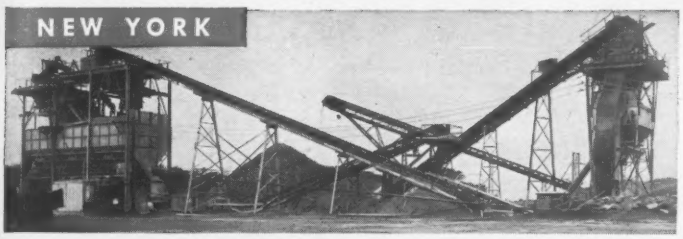

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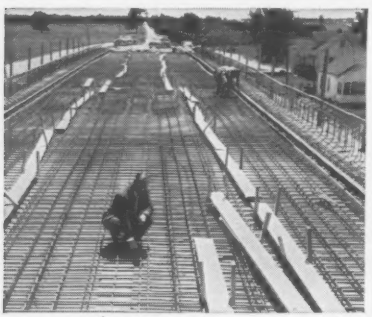
The ideal answer to this problem was a 687-foot-long, 9-foot-diameter, 10-gage, asphalt-coated Republic Sectional Plate Pipe. Precise prefabrication of plates made field assembly easy. Completed pipe was buried in a cut through higher ground, allowing excess water on the development site to run off to the Houston Ship Channel. All requirements for speed and economy of construction plus trouble-free performance were met with ease.

Whatever your drainage problem, it will pay you to check with your nearest Toncan Drainage Products Manufacturer listed on the opposite page. He can show you how to save by installing Republic Drainage Structures in any weather, with unskilled labor. A wide variety of sizes, types and gages are available to meet your needs exactly. Types include Corrugated Metal Pipe, Perforated Corrugated Metal Pipe, Corrugated Metal Pipe-Arch, Sectional Plate Pipe, Sectional Plate Pipe-Arch and Sectional Plate Arch.



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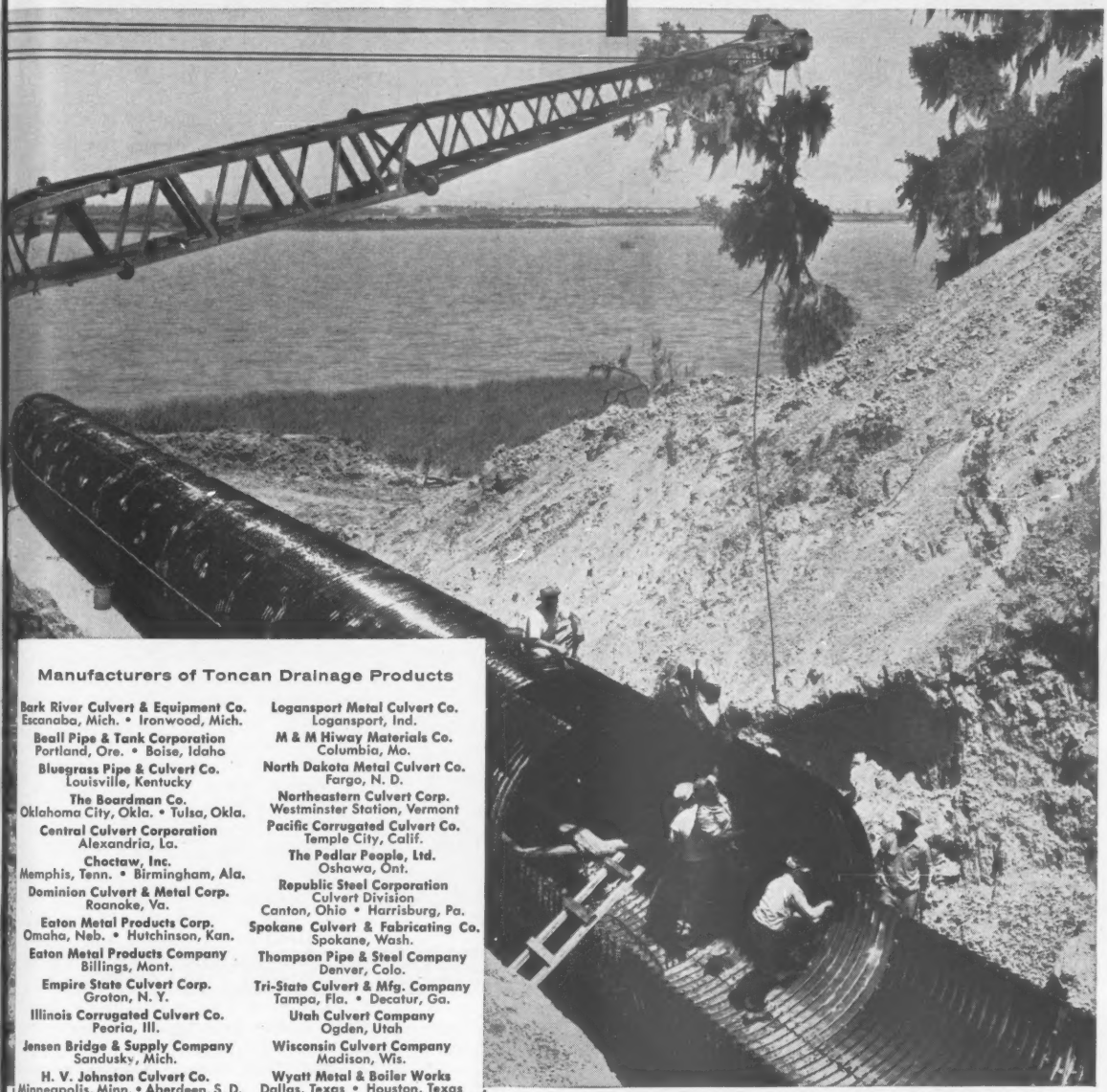

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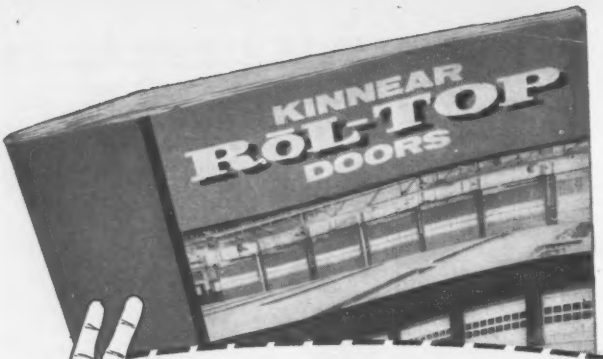

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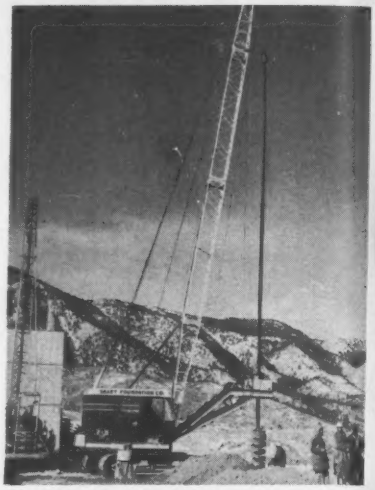
. . . Academy foundations



CRAWLER CRANES with long booms and earth augers drilled concrete caissons to very dense substrata.

of sliding friction will be at least 0.67 instead of 0.42, and the larger angle of internal friction increases the safety factor against slope failure from 1.5 to more than 2. Such a factor of safety was considered reasonable.

• **Modified counterfort walls**—When the height of retaining wall exceeded 16 ft, the cantilever wall was found to be more expensive than the counterfort type. Further study disclosed that the counterfort type could be made more economical by introducing an anchor structure at the heel of the counterfort. The anchor structures were proportioned to engage a sufficient amount of soil above—thus producing a downward reaction—to counteract the overturning moment due to the horizontal earth pressure against the vertical wall. Counterforts were provided at 14 ft spacing.

Construction is under the supervision of the Air Force Academy Construction Agency. Col. A. E. Stoltz is the director. C. L. Tyler and E. A. Merrill are general manager and director of engineering respectively, for Skidmore, Owings & Merrill's Colorado Springs office. John Merrill is in charge of the entire project, with Walter Netsch in charge of design and Jack Train, chief of production.

The retaining wall and grading work was contracted to T. F. Scholes, Inc. The caissons were drilled by A. H. Beck Foundation Company and Saxet Foundation Company, both of San Antonio, Texas.

Foundation and soil tests were made under the direction of Robert Novak, of Skidmore, Owings & Merrill, and Pat Sandlin, of the Air Force Academy Construction Agency.

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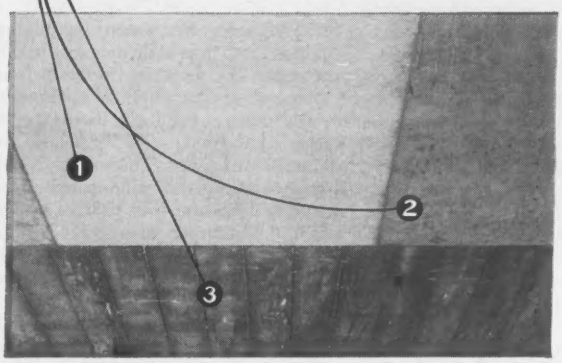

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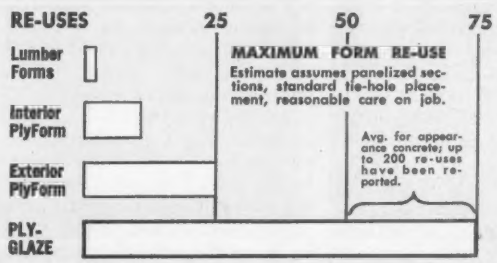

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Exterior PLYFORM	.234	.023	.009	Gives Max. 25 Re-Uses		
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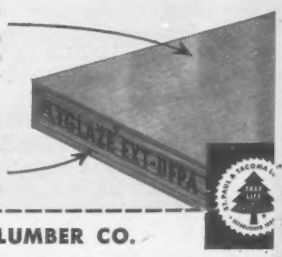

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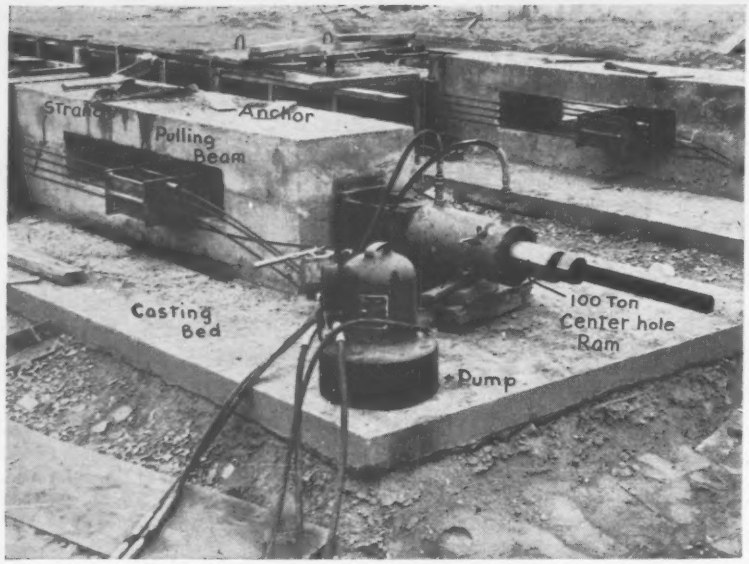
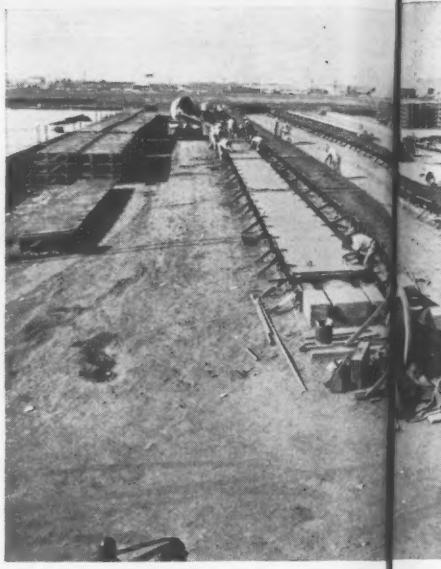


Pretensioning of roof framing was carried out . . .



. . . On the job in temporary casting

On-Site Prestressing Plant Cuts Concrete Bui

Concrete roof panels for a 100,000 sq ft Los Angeles warehouse were pretensioned on the job instead of at a precasting plant. And the operation was economical in spite of the necessity for constructing temporary casting beds.

The job is part of an installation being built for the Lamp Division of the General Electric Co. In addition to the warehouse, the work includes some 20,000 sq ft of office and service facilities not roofed by the pretensioned panels.

The precast, pretensioned double-tee roof panels are carried on precast, pretensioned composite girders. The warehouse is nearly square in plan, the area being divided into 40x26 ft bays. The roof panels span the 40 ft width between girders. Precast concrete columns and a combination of tilt-up and cast-in-place concrete walls complete the structural scheme.

• **Buy or make?**—Decision by the contractor to undertake casting the roof members on the job site was based on a study of bids received from available pretensioning plants. The best bid from a San Francisco area plant was $1.91 per sq ft delivered. This included about 25¢ per square foot for shipping costs. Cost from a Los Angeles pretensioning plant was $2.05 per sq ft for the roof structure in place.

A preliminary cost study indicated that the job was large enough to absorb the cost of constructing temporary casting beds and of purchasing the necessary stressing equipment. The contractor's estimate for fabrication of the roof structure, including temporary plant costs, was $1.65 per square foot. This has been substantiated in the actual work.

• **Prestressed units**—The typical double-tee roof panels for this job were designed on a 5 ft wide module. Slab is 2½ in. thick and total depth is 14 in. Stem thickness is 3⅜ in. to provide coverage for a single vertical row of pretensioning strands in each of the two stems. Area of strands in each stem is 0.32 sq in. (consisting of 4 strands of ⅜ in. nominal diameter with each strand having seven high-tensile, stress-relieved steel wires).

The centroid of the prestressing steel area drops from 8 in. above the bottom of the tee or stem at the ends of the members to 2¼ in. at midspan. Purpose was to reduce the amount of steel required as well as to control stresses and camber. By this means, maximum camber was held to ⅝ in. under the dead load of the roof panels alone. After addition of roofing and mechanical loads, the roof will be practically flat.

Initial jacking stress was 175,000 psi (ultimate strength is 250,000 psi) or 14,000 lb per strand. Effective prestress after losses is figured at 140,000 psi or 11,200 lb per strand.

Nine of the roof panels were designed to carry heavy unit ventilators requiring a 4 ft square opening in the roof slab. The resulting deviation from the typical section required about double the prestressing force in the panel. Rather than make one bed and the necessary stressing equipment doubly strong to suit these nine panels, they were redesigned for four straight pretensioning strands per stem. One ¼ wire, post-tensioned cable was added to each stem to make up the required prestress.

• **Job-site casting beds**—Main problem in pretensioning at the job site is design of the casting beds. The units had to be easily demolished after use. Yet, they had to be sufficiently stout to resist the pretensioning force.

Usually heavy abutments supported by pile clusters or deadmen resist the packing forces. But in the G. E. warehouse case, the casting-bed concrete carries the load—figured as an eccentric force of 112,000 lb for each bed. The fact that no flexibility or reserve capacity for future projects was required permitted considerable savings in steel and concrete over the design of permanent pretensioning beds.

All bed designs called for 5,000 psi concrete. The slight additional cost of such high-strength concrete was offset by the cost of demolishing and disposing of additional bulk that would be required for lower strengths.

To meet construction schedules, and for the most economical use of forms

orary asting beds and . . .

. . . Roof members were swiftly erected by crane.

te Building Cost

and other equipment, four beds for casting the roof panels were constructed. Three beds were built 341 ft long to take eight of the 40x5 ft typical roof panels per run. These beds were scheduled for 18 runs each.

The fourth bed was designed for a few shorter panels as well as typical length panels. It was made 170 ft long to utilize additional formwork to the best advantage. Fourteen runs were to be made on this bed, the additional time being required to alter the formwork for several types of panels.

Beds for roof panels were designed as inverted tee-sections, the slab being 4 in. thick by 6 ft wide. The stem of the tee is 12 in. high and 20 in. wide, and it projects into the space between the stems of the double-tee roof panels to support the forms for the top slab. Sheet steel forms on wood framing were used throughout.

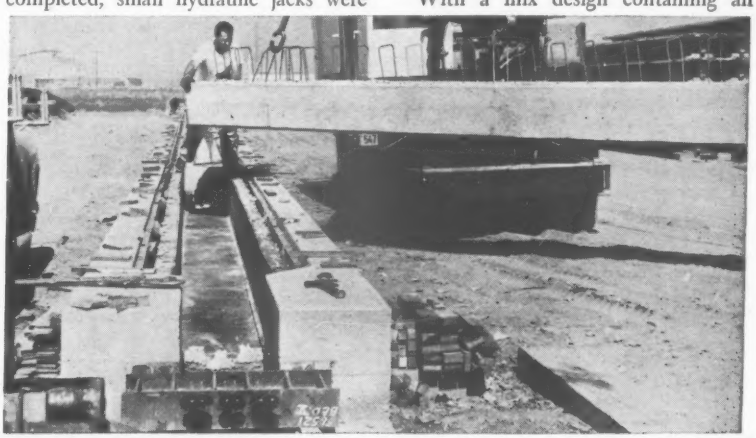
Stressing of the tendons was accomplished with a 100 ton centerhole hydraulic ram coupled to a remote, electrically actuated, double-acting pump. For the panel beds, a single high-tensile, 2 in. dia, steel pull rod was connected to the center of an I-beam, which carried the two rows of the strands for the panels. All strands were pulled straight at their lowest point for the length of the bed to slightly less than their initial design load. Snap-tie hold-downs were provided at points along the bed corresponding to midspan points of the members. After the initial tensioning was completed, small hydraulic jacks were used to raise the strands to their proper position at the ends of the members.

• **Concrete is light but strong**—The design of the roof panels required lightweight concrete with a maximum density of 100 lb. per cu ft. Specified strength was 3,500 psi at transfer of prestress and 4,000 psi at 28 days.

To obtain these strengths in a period of time compatible with the construction schedule, the contractors planned on steam curing. But this would have cost some $10,000. On the advice of their engineers, a series of test panels and cylinders were cast with varying cement content, water-cement ratios and admixtures. Results indicated that the required strength for transfer could be achieved by open-air curing in less than 72 hours.

With a mix design containing an

Strands in TT form were sloped by positioners (arrow) at ends and center.



Pretensioned girder was fabricated with projecting stirrups, which after erection were embedded in cast-in-place concrete to tie the roof together.

DRAFTING TRENDS

POST's handy checklist can speed up your Drafting Room Checkup and serve as a reminder of possible places where you can increase drafting efficiency.

The trend to thorough equipment checkups

Stepped-up production in the plant almost always means stepped-up activity on the board. Unfortunately, there is rarely time to stop and take stock of what is happening to drafting room efficiency as the work load increases. It is often necessary to improvise with what you have, or hastily expand as the need occurs.

With the shortage of manpower obviously continuing, it is apparent that a careful, critical review of drafting methods and equipment can lead the way to greater productivity. Department heads in some companies are setting aside a specific time every year to *completely analyze the drafting room.* The trend is to planning additions, improvements and reorganizations during such checkup periods.

One way to pinpoint possible increases in productivity is to go, item by item, through a checkup-list showing every type of product used in a modern, well-equipped drafting room. Such a list is available from the Frederick Post Company. It covers equipment and supplies from A to Z and suggests where you can make improvements.

Here are some typical examples of what you might look for during a Checkup: Cutting down waste motion by using modern drafting tables and drafting machines; eliminating time-consuming methods by using special grid-lined sketch pads, templates and other devices; reducing fatigue and increasing comfort by installing newer equipment; saving space with up-to-date files, etc.

Whatever the need, a logical, well-planned analysis of current and contemplated drafting operations is likely to unearth improvements.

Trained specialists in complete checkups

Practical assistance in making your checkup can be obtained from your POST supplier, who frequently helps make such efficiency surveys. He is experienced in all phases of drafting room operation and is a valuable source of ideas for everything from a major reorganization to producing hard-to-find supplies. Call your POST supplier and ask him about some of the techniques other companies use in surveying drafting room operations and boosting productivity. You will find his thinking a valuable addition to your own appraisals.

For more information and a POST checkup-list, write to the Reader Service Division of the Frederick Post Company, 3658 N. Avondale Ave., Chicago 18, Ill.

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. . . On-site pretensioning

admixture and less than 8 sacks of cement per cu yd, the beds were operated on a 3 day cycle, allowing about 66 hr for curing and one day for stripping, cleaning, stressing and placing concrete. Careful control of the slump—less than 3 in.—contributed to the early attainment of the transfer strength. Result was 28 day strengths over 5,000 psi.

The admixture involved was a retarding densifier type. It retards initial set, permitting excess mix water to bleed off prior to the set. As a densifier, it has the effect of reducing size of cement gel around each particle of cement, thus reducing shrinkage. The admixture also facilitates vibration, which increases rate of strength gain by permitting a reduction in water-cement ratio.

• **Girders pretensioned too**—The composite girders consist of a 16x18 in. precast, pretensioned lower flange with a cast-in-place upper section. The pretensioned part of the girders was stressed with twelve $\frac{3}{8}$ in. dia strands placed in two horizontal rows.

During erection, the lower portion is shored up at intervals between columns until the cast-in-place concrete achieves its required strength. Thus, after the shoring is removed, the two portions act together to carry both dead and live loads. The cast-in-place concrete serves to tie the roof panels to the beams and permits placing mild steel over the columns for continuous beam action. Welded connections between roof panels give the roof resistance to lateral loads in the opposite direction.

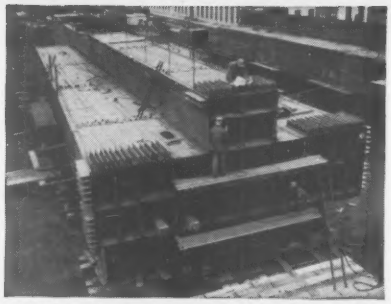
The separate bed for casting girders was designed as an inverted channel section. This shape has a double advantage. First, the vertical legs provide rigid bearing for the side forms of the girders. Second, the prestressing force coincides with the center of gravity of the bed cross section to eliminate bending resulting from eccentric loading. The initial pretensioning force for the girders cast on this bed was 168,000 lb.

The 170 ft long girder casting bed could accommodate 6 girders at a time. Fourteen runs were necessary to cast the 84 girders.

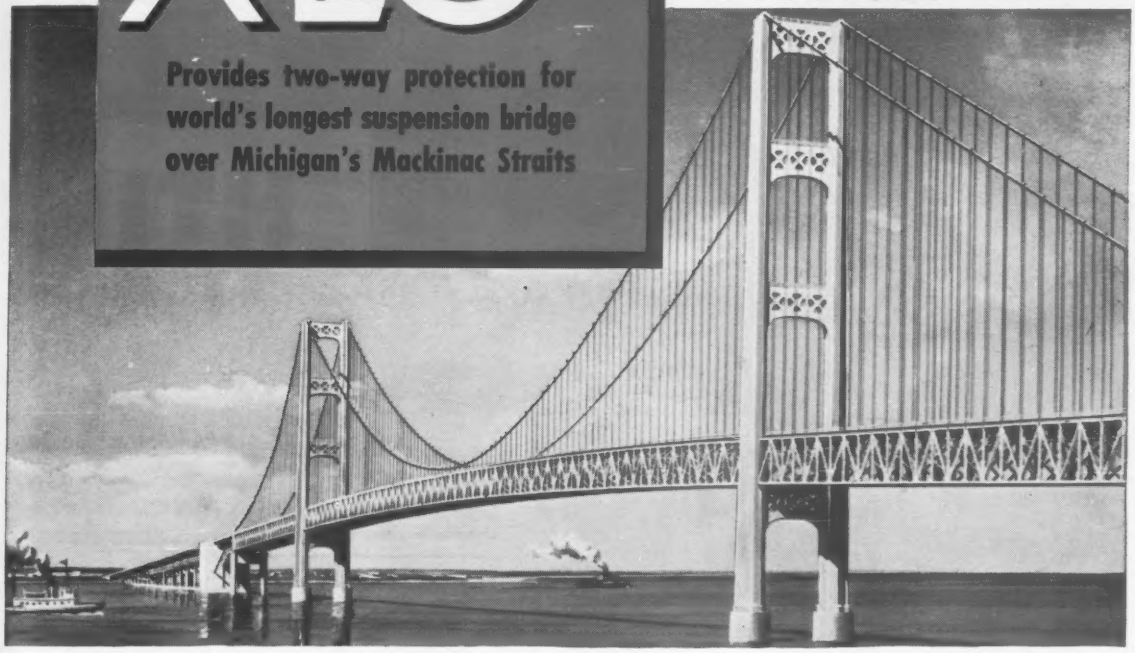
Architects for the project were Albert C. Martin and Associates. T. Y. Lin and Associates consulted on the design of the pretensioned roof structure. James Wubbena, project manager, and Stan Boutte, job superintendent, headed up operations for the Los Angeles general contractors, Noyes Roach Co. and C. L. Peck, a joint venture. Design of the casting beds and production consulting was furnished to the contractor by Edward K. Rice and Herman R. Reuter of T. Y. Lin and Associates. P. B. Unthank represented General Electric as resident engineer.

Pittsburgh's X-L-O STRUCTURAL STEEL PRIMER

Provides two-way protection for world's longest suspension bridge over Michigan's Mackinac Straits



One of the tower sections being assembled at Ambridge Plant of the American Bridge Division, United States Steel Corporation.



1. Safeguards steel shapes against corrosion during transit and erection

2. Makes an excellent foundation for field painting

A **70-YEAR** dream come true! That's the new five-mile bridge now being erected to link Michigan's upper and lower peninsulas. This huge project was designed by Dr. D. B. Steinman. The American Bridge Division, United States Steel Corporation, is fabricating the 75,000 tons of structural steel for its superstructure and major portions of the foundation caissons and cofferdams.

This giant project features a suspension bridge with a center span of 3,800 feet, two 1,800-foot side spans, and two 472-foot unloaded backstay spans. Total length, including anchorages, is 8,614 feet, making it the world's longest suspension bridge.

Structural shapes for this viaduct are shopcoated with Pittsburgh's X-L-O Primer to protect them against corrosion during storage, transit and erection. This remarkable finish eliminates need of costly metal cleaning. Its remarkable wetting characteristics assure uniform coverage even over surface irregularities caused by mill scale. Satisfactory through drying of film within twenty-four hours, regardless of weather, makes possible prompt shipment to job sites.

X-L-O Primer also serves as an excellent foundation for final coats. Pittsburgh's IRONHIDE and METALHIDE, in suitable colors, are available for field coating.

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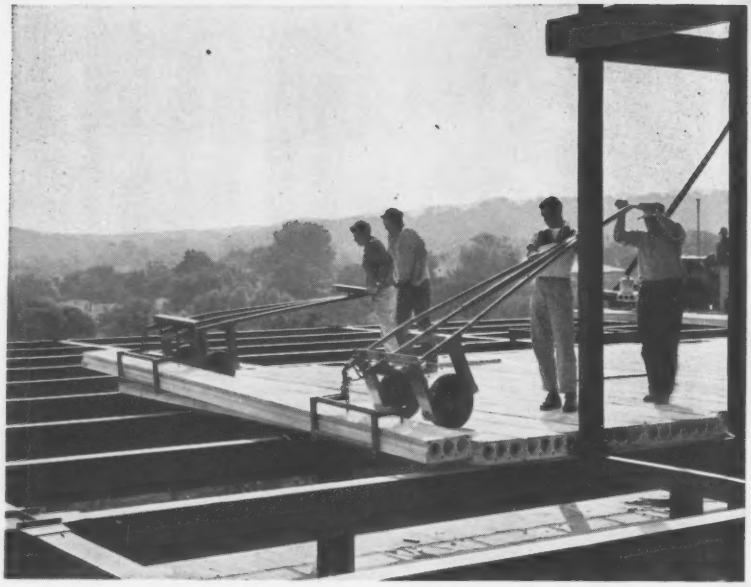
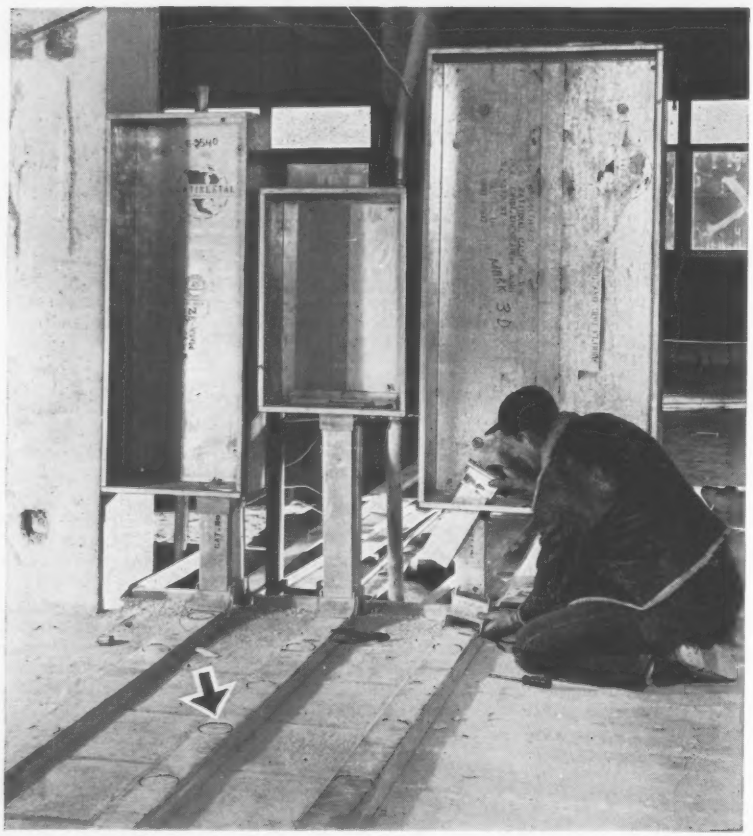


Research building in Dayton, Ohio is floored with precast concrete cellular slabs, which also serve as electrical conduits.

Cellular Concrete Floors Wired Easily



HEADER DUCTS from each service panel box run across the floor at right angles to the longitudinal cells of precast floor plank. The lead wires from the headers pass down into the cells through handhole junctions (arrow), spaced every third cell across the floor.

The design of a 6 story building erected at the National Cash Register plant in Dayton, Ohio, and intended for use as a research-engineering facility, imposed severe requirements on the floor system:

- Electrical needs of research operations made flexibility and availability prime characteristics of the electrical distribution system.
- Design floor loading should permit manufacturing operations if expansion of the engineering-research departments, forced them to move to larger quarters.

Specifications for the electrified floor were written for competitive bidding on steel or concrete cellular floors. The concrete floor system was low by $80,000.

- **Precast floor**—The low bidder chose precast cellular concrete plank made by the Flexicore Division of Price Bros. Co., Dayton, for the 210,000 sq ft of floor area and for the roof of the 100 x 350 ft building. The units have a 6 x 16 in. cross section and a typical length of 20 ft. Every fifth unit had steel plates embedded so that the slab could be tied to the steel frame of the building. The floors were laid at the rate of 4,000 sq ft per day.

Grout was placed in the key joint between adjoining planks to lock the floor into a flat, rigid unit. A 1½ in. topping of concrete was then placed to cover the entire structural floor. The building was designed for a floor loading of 150 lb psf.

(*Continued on p. 64*)

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- 100 hp

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SMOOTHEST LOADING You get crowding action PLUS with a hydraulic torque converter drive that multiplies torque 350 percent. You quickly and smoothly load the toughest materials — no butting, no ramming, no engine stalls. And there's a scooping action, too, with the tip-back bucket. Result — heaping loads fast!

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PLUS rear-wheel power steering . . . 4-wheel drive and 4-wheel power brakes . . . "Hi-Traction" differential . . . long wheel base for greater stability . . . rear-axle disconnect for free wheeling from job to job . . . 4-way adjustable seat for greater operator comfort . . . Allis-Chalmers diesel engine.

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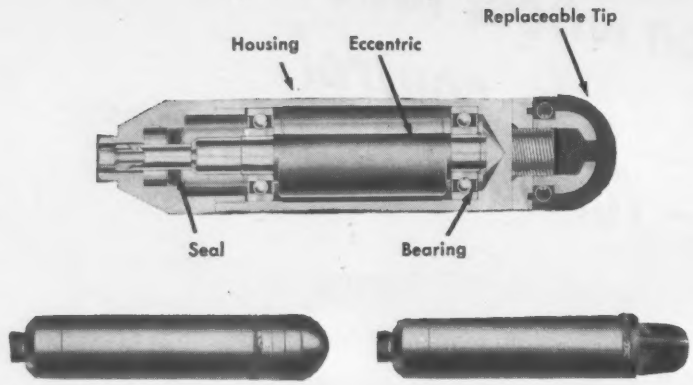


SIMPLE DESIGN — Short head Viber vibrators are simple in design and have few parts as indicated in cut-away picture above. Head assembly with replaceable rubber tip is shown at left. Assembly with 3-finned steel-cast tip at right.

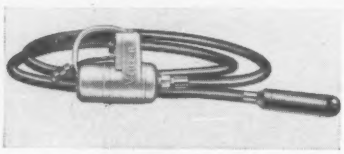
Short Head Viber Vibrators Offer Major Advantages in Placement of Concrete

VIBER VIBRATOR heads are short, easy to manipulate—simple, easy to maintain. Simple construction of the Viber head makes a compact assembly which maneuvers easily around steel and into awkward, hard-to-reach places.

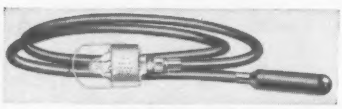
The Viber design utilizes a single eccentric weight in a heat-treated alloy steel housing. Other parts are one bearing at each end of the weight and a grease seal. Viber patented replaceable rubber tip is standard equipment, with 3-finned steel cast tip optional.

Viber heads are light weight, ranging from 6 to 16 pounds... 11 to 12 inches in length and are available in four diameters—1¾ in., 2⅛ in., 2½ in. and 3 in.

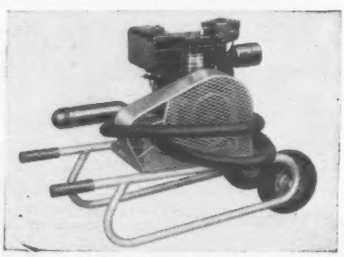
Flexible shaft driven, Viber vibrators are powered by electricity, gasoline or air... easily adapted to varying job conditions. They are high speed, operating at speeds between 8500 and 11,000 rpm.



Model E Electric



Model P Pneumatic



Model G Gasoline

Viber Replaceable Rubber Tips

Viber rubber tips save contractors thousands of dollars yearly by preventing damage to forms of plywood and other expensive materials. In addition, since most wear on a vibrator occurs on the end of the housing, use of replaceable rubber tips greatly extends housing life.

Viber vibrators are effective. More work can be done in less time and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.

For complete information on Viber vibrators and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif. Dept. 16E4.

VIBER

VIBRATORS SINCE 1931

• **Electrical systems**—For engineering and research, the building had to provide three electrical services—115/230, 277/480 and 440 volt. Power for these services comes from a load center in a transformer vault in the basement. It is transmitted by bus ducts up four pipe shafts to the various floors.

Breaker type plugs, a thermal circuit breaker used instead of fuses, are used on the leads in the riser ducts feeding transformers, which reduce the current from 440 v to 115/230. The neutral for the entire system is grounded and unbroken.

A special service is provided by a motor-generator set, which can vary both voltage and frequency as desired.

• **Underfloor distribution** — The electrical services are carried by separate underfloor distribution systems. Header ducts run from panel boxes through handhole junctions. The 115/230v service connects only with a group of cells reserved for 115/230 v service. The 440 v and telephone services are distributed in the same manner.

These services are available almost at any point on the floor. The cells in the precast plank are 5¼ in. c-c and are used in sequence for the three services—first the 115/230 v, then the 440 v and then the telephone. Each service, therefore, is located every 16 in. across the floor.

The 277/480 v service for fluorescent lighting is supplied through conduits attached to the underside of the floors and by drop cords to the fixtures installed in the suspended ceilings.

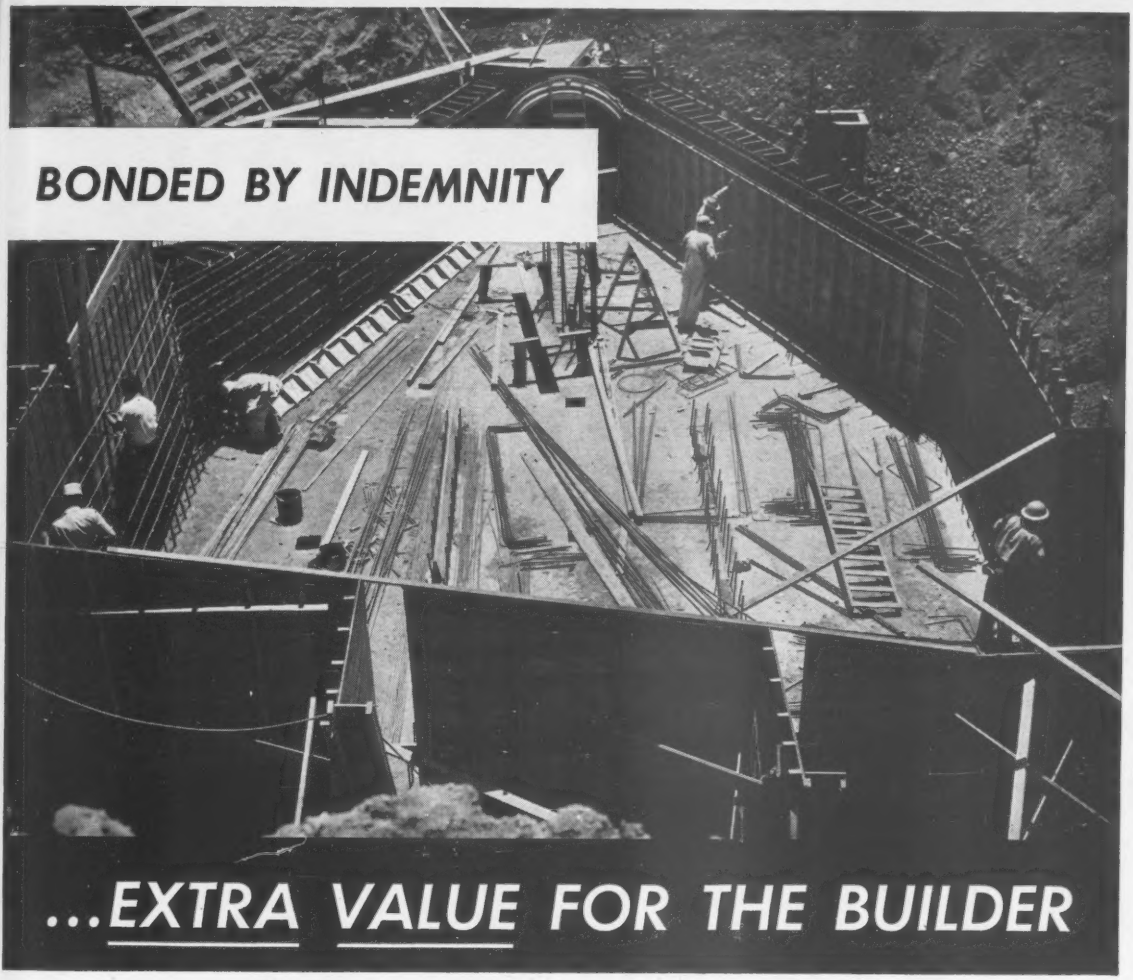
• **Air conditioning**—Conditioned air is supplied to the perimeter of the building by chilled or hot water "fan and coil" units. Interior areas receive conditioned air through the perforated metal pan accoustic ceiling. Cooling is obtained from a steam absorption system using exhaust steam from turbines in the boiler room.

• **Plumbing**—The engineering and research projects require special lines to be run vertically through the floors at many locations. These lines include compressed air, distilled water, oxygen, acetylene, acid-proof drains, as well as hot and cold water.

Holes for these lines are drilled at the joints between adjoining floor planks. A hole to accommodate a 2 in. pipe thus can be drilled without disturbing either the reinforcing steel or the hollow cells.

Architects for the building were Lorenze & Williams. Schweiger, Heapy & Associates were the consulting mechanical engineers. Charles H. Shook, Inc., was the general contractor and Wagner-Smith Co. was the electrical contractor. All are Dayton firms.

VALLEJO, CALIFORNIA is the location of this new Storm Drainage Gas Pumping Station, built with the protection of an Indemnity Insurance Company of North America contractor's bond.



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What should a contractor look for in a bonding company? The experience of Indemnity Insurance Company of North America, with its financial capacity and complete service facilities, gives a contractor just what he needs in handling his bond requirements. The Storm Drainage Gas Pumping Station at Vallejo is a recent example of the wide scope of Indemnity's dependable and efficient bonding service. All this adds up to 'Extra Value' in coverage and, for contractors who qualify, preferred rates* and prompt attention to their requirements.

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Versatile A-W saves many costly hours of maintenance time.

Here's the most versatile hoisting tool in industry... the A-W HYDRAULIC CRANE

Combining its unique pickup, carrying and placement capabilities with the best features of other types of cranes, the A-W Hydraulic Crane sets a new standard of performance. Take a look at some of the reasons why it does more jobs better than anything in its class:

Live boom action—The 18-ft. boom is under complete hydraulic control, responds instantly to the operator's touch with smooth, positive action. Rotates a full 360° if necessary. Can extend and lift a live 5-ton load while it pulls, moving forward or backward at the same time. Because it's powered both ways, up and down, you can't drop anything you're hoisting—an important safety feature.

Works indoors and out—Its sturdy, close-coupled chassis with all-wheel steer gives fast travel in and out of buildings and around obstacles. All-wheel drive and oversize tires take it through sand, across rough terrain, over rails with perfect ease. When the going is particularly tough, when storage areas are muddy or snowy, or there are ramps to climb or freight cars to push, all-wheel drive and the torque converter (optional) really do a job.

Easy, low-cost operation—Simplicity is the key-word for the entire operation of the A-W Crane, and anyone can easily learn to operate it in a very short time.

As for costs, this is the report of a typical user: "The daily machine cost of $11.11 is less than one hour's payroll of the six men this tool assists. With it, they are able to do a job in half the time. Very conservatively, our hydraulic crane is returning 100% a year on our investment."

Ask your nearby A-W distributor to tell you all about the time- and money-saving advantages of this remarkable machine. Or write direct to Austin-Western, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Aurora, Illinois.

Write for Data Book 2253—full of facts on working ranges, boom extensions, minimum aisle widths, tractive effort, towing capacity, and special attachments.

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Using assembly-line construction methods . . .

Builder Mass-Produces Houses on Site

One of the most efficient techniques of American industry, mass production, can not always be practiced in building. But the Aldon Construction Co., Los Angeles homebuilders, have used it to chalk up an impressive 12 year record.

Since World War II, the company has built 26,000 houses, valued at over $300 million. Volume last year totaled $32 million. And despite the current housing picture, Aldon's 1957 starts are expected to top last year's.

At the core of the Aldon system is a very simple rule: Each man has one job. Carpenters who scribe don't saw; those who saw don't nail; those who lay plates don't erect studs; and so on. It might be tedious for the workman, this lack of variety, but he gets so good at his job that he can do it in his sleep. And the high specialization promotes the kind of efficiency the Aldon management wants.

• **26 operations**—Up to a point in the construction of a house Aldon men do the whole job. Beginning with sewer stakeout, the work is broken down into 26 different tasks, each the exclusive assignment of one or more crews.

One crew does nothing but mark wall and partition locations on floor slabs; another lays down 2x4 plates, and a third crew marks the plates to show door and window locations.

Sheathing a roof is a three-operation job: One man takes lumber from a stack and leans it against a building; a second man, working on the roof, draws the lumber up and cuts it to size; and a third man nails it with a pneumatic hammer.

• **Subs work same way**—When the Aldon men finish, they turn the job over to subcontractors—plasterers, cabinet men, floorers, plumbers, electricians, painters and others. These subcontractors operate on the same assembly-line principle. One painting crew, for example, paints fascias only, another seals walls, and a third does nothing but paint window trim.

The number of crews performing each operation depends on the time the operation takes. Thus, if it takes eight hours to concrete a foundation slab and only two hours to lay out wall lines for a house, there will be four foundation crews to every wall-layout crew.

Obviously, you can apply these techniques only to volume production. According to the Aldon rule-of-thumb, you must have at least 350 houses under construction to keep production moving smoothly. Otherwise some crews are going to be twiddling their thumbs waiting to move to the next house.

On its present job, Canoga Plaza, in the San Fernando Valley, Aldon is turning out houses at the rate of 10 a day and employing about 1,000 men. The organization has an almost-military chain of command. At the bottom is a subforemen or leadman for each crew. He reports to a foreman who has charge of all crews performing a particular operation. Next up the line are general foremen, with responsibility for groups of foremen. At the top is a general superintendent, with overall responsibility for a development.

• **Luxury development next**—Canoga Plaza houses sell for around $16,000, but Willard Woodrow, head of Aldon, sees no barrier to mass building of higher priced houses. Buyers of luxury homes, he reasons, will buy in a development for the same reason that motivates purchasers of low-cost houses, namely, they get more for their money. Woodrow is now planning another San Fernando Valley project containing over 400 houses priced at $30,000 to $35,000.

$16,000 MODEL is currently rolling off the Aldon production line but the firm plans to start a development containing over 400 houses priced about $35,000.

"Material-handling worries ended," reports leading Wisconsin building contractor

TIME, LABOR COSTS CUT IN HALF by versatile Michigan Tractor Shovel

Savings of 40 to 90% in time and 50 to 75% in labor costs resulted when the Selmer Company, Green Bay, Wisconsin, assigned material handling to this Model 75A Michigan Tractor Shovel.

"You might say the Michigan combined the mobility of a pickup truck with the traction of a crawler," explains one Company official. "It certainly eliminated the usual problems of unloading and moving building supplies: the slow expensive hand labor . . . the slowness and lack of mobility of crawler-loaders . . . the lack of capacity of easy-to-get-stuck farm-type tractors."

Saves 3 man-hours unloading blocks

In the two years since its purchase, Selmer has handed dozens of jobs over to the 1¼ yd 80 hp Michigan. Above is a common assignment—moving palletized concrete blocks from trucks to scaffolding. Unit lifts 68 blocks, weighing 3,800 lbs AT ONCE. These are stacked 10 ft high so laborers can skid blocks direct onto scaffolds. Entire job, including stacking, takes two men 10 minutes. Unloading alone used to take five hand-laborers an hour. And an elevator had to be set up and used continually.

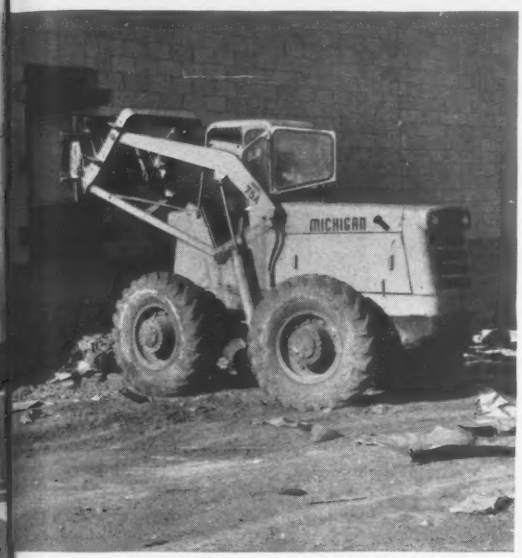
Saves $15 to $25 per brick truck

Similar savings are reported when brick is handled. It used to take four men using brick tongs three hours to unload a semi-trailer. Now, Selmer has the bricks palletized in 500-unit lots, 12 pallets to the semi . . . unloading takes the Michigan and two men 10 to 15 minutes. Smaller trucks carry 4 pallets, take 5 minutes to unload with the Michigan compared to 1½ hours with four hand laborers. Savings average $15 to $25 per truck *including* extra charges for palletizing!

Replaces expensive crane to unload marble

Unloading carloads of marble or cast stone always gave Selmer Company a costly headache too. Formerly, they

nted a crane. Recently, however, their veteran shop fore-
an, Norb Tilkens, designed and fabricated a special boom
hich attaches to the tilt bracket. With this, the Michigan
eaches across a truck, lifts two or three slabs of marble
om the railroad car, gently lowers each 700 lb load to the
uck bed. In a few hours, the car is completely unloaded.
avings on a typical 15-car shipment run $500 or more.



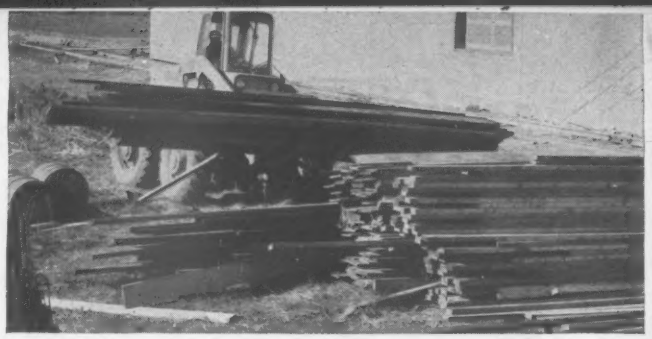
liminates ramps, ump set-up for concrete

Above is another home-made attachment . . . a concrete
cket which can be lifted on the Michigan forks. It carries
ur wheelbarrowfuls per load. Pour is made simply by
ing forks slightly forward so concrete flows out of 6"
uare spout into forms. Time and labor of barrow-men are
ed. Nor does Selmer have to build ramps or, on small
urs, set up a pump.

andles wide variety of other materials

os of other materials have been handled from time to time.
me of them are:

ip-rap — old brickbats and concrete dozed into river protect building.



Lumber —as much as ¾ of a truck load (3500 to 4000 lbs) unloaded at once, stockpiled, later carried to hoist.

Rolls of reinforcing wire—carried on forks, stockpile to hoist. Fork spacing changed in seconds to fit roll openings.

Trash — cleaned from around building site.

One man changes bucket, forks

Some of these jobs, you'll note, call for fork lift, some for tractor shovel bucket. These two attachments (and others) are easily interchanged. It takes Selmer's operator, John DeMoulin, working alone, 10 minutes.

In two years, NO breakdowns

No matter what the job, Selmer Company can *depend* on their Michigan working a full day! "In two years . . . over 6,000 operating hours," recalls Shop Foreman Tilkens, *"we've NEVER had the machine break down* on the job. It has saved us over 50% in time and manpower!"

A Michigan could do as well for you!

Michigan is a registered trade-mark of

CLARK® EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2401 Pipestone Road
Benton Harbor 28, Michigan
In Canada: Canadian Clark Ltd., St. Thomas, Ontario

NEW SAFEGUARD
AGAINST BREAKDOWNS—JOB DELAYS!

Contractor PM System Includes:

1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
2. Operator's Recommendation Card—lists the correct lubrication recommendations for each piece of equipment.
3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

Socony Mobil's Contractor PM System—a simplified method of keeping your equipment on the job—and working!

Here, for the first time, is a practical program that reduces paper work, yet forestalls equipment breakdowns caused by improper lubrication. It's an easy-to-follow system designed especially to help contractors keep their equipment in working condition . . . and an important part of Socony Mobil's Correct Lubrication Program which also includes:

Famous Quality Products such as Delvac Oils, New Mobilube GX Multipurpose-type Gear Lubricant, Mobiloil and Mobilgrease.

Lubrication Engineering Service covering analysis, advice and use of Socony Mobil's outstanding technical know-how.

Ask your Socony representative to show you how this ingenious new system can help you.

SOCONY MOBIL *Leader in lubrication for over 91 years*

Mobil *Correct Lubrication*

A PROVED PROGRAM TO REDUCE EQUIPMENT MAINTENANCE COSTS

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

Wipe surfaces of coupling clean . . .

Coat with lubricant sealer . . .

Shove spigot into bell of first pipe

Compression Ring Joint For Clay Sewer Pipe

Permanent joints in clay sewer pipe that are said to be watertight, root-resistant and flexible can be made with a new compression-type coupling.

The coupling is put on the pipe at the factory, to assure uniformity and consists of rings that are molded and fused on the spigot and in the bell of the pipe.

A joint is made by applying a special lubricant sealer to the mating surfaces of the coupling and pushing the spigot firmly into the bell socket. Field tests show that even in muddy, water-filled trenches, tight joints can be made in a minute or less, according to the manufacturer.

Polyvinyl chloride is used in making the coupling, since it is resistant to acids, gases and greases normally found in domestic and industrial sewage. W. S. Dickey Clay Manufacturing Co., P. O. Box 228, Kansas City, Mo.

Radio Surveying Unit Can Eliminate Some Taping

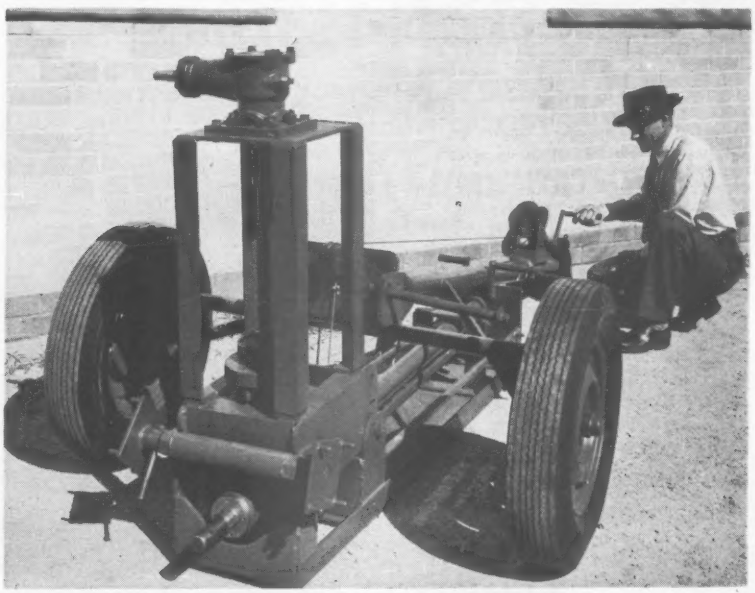
A new electronic surveying instrument, introduced in England, eliminates the need for physical measuring, as with tapes, and is claimed to be many times more accurate than optical range finders.

Working range of the new instrument, called the Tellurometer, is from 500 ft to 35 mi. It operates by measuring the travel time of radio waves over the distance to be measured. Measurements can be made by day or night. Visibility has no effect on its operation; all that is required is a line unobstructed by a solid object.

The Tellurometer system operates in the 10 cm wavelength. To measure a single line, one master station and one remote station are needed. Measurements are made from the master station with the assistance of an operator in the remote station. A built-in duplex radio telephone circuit is included. With one master station and several remote units, a number of different measurements can be made with one setting.

Both master and remote instruments are portable, self-contained units with built-in aerials. Applications for the new instrument include general as well as precision surveying work. It reportedly offers particular advantages in bush or flat country where the instrument can be set on raised structures that need not be as rigid as those needed for a theodolite. It also is expected to find uses in hydrographic and aerial surveying—Cooke, Troughton & Simms (Vickers Group), Haxby Rd., York, England.

(*New Products continued on page 72*)



Horizontal Auger Bores Under Pavements

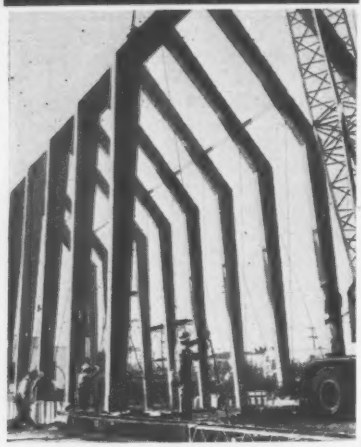
A new earth auger has been developed in Australia specifically for putting utility lines and other services under highways.

The machine is operated by two men. One drives the tractor which supplies power to the drill; the other operates the auger.

According to the manufacturer, a 7½ in. hole has been bored in sandy loam at the rate of 45 sec for each 3 ft length of drill. Approximately 1 min is required for fitting the next section. In hard, dry clay or limestone marl, the normal rate of boring is reported to be about 1 fpm.

In wet clay, a special clay auger is used to prevent clogging. Proline Sales Ltd., 41 Boomerang Rd., Croydon Pk., South Australia.

a SUPERIOR story



CHURCH FRAMED WITH 58 Ft. HIGH PRECAST BENTS WEIGHING UP TO 40 TONS!

To form the frame for the First Presbyterian Church of San Mateo, Calif., eight concrete bents—believed to be the highest ever precast—were hoisted into place.

This was accomplished by use of SUPERIOR'S New 1¼" Inserts which provided the proper anchorage for lifting and positioning these giant precast members.

The 16" thick legs ranged from 16" to 32" wide. Two of the largest members weighed 78,000 lbs. each! Trewitt and Shields of Fresno, Calif. was the gen'l. contractor.

On any precast job, of tilt-up panels or structural members, you can be assured of safety and reduced overall costs with SUPERIOR Accessories. Request a copy of 4 page Bulletin PR-1.

SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Pk., Ill. (Suburb of Chicago)

N. Y. Office
1775 Broadway
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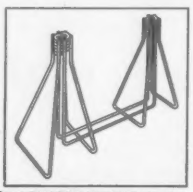
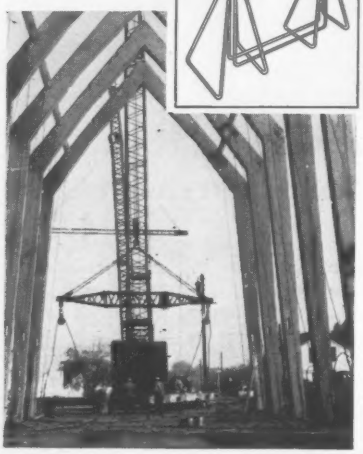
Pacific Coast
2100 Williams St.
San Leandro, Calif.

SUPERIOR 1¼" Insert (Type 11) shown at right.

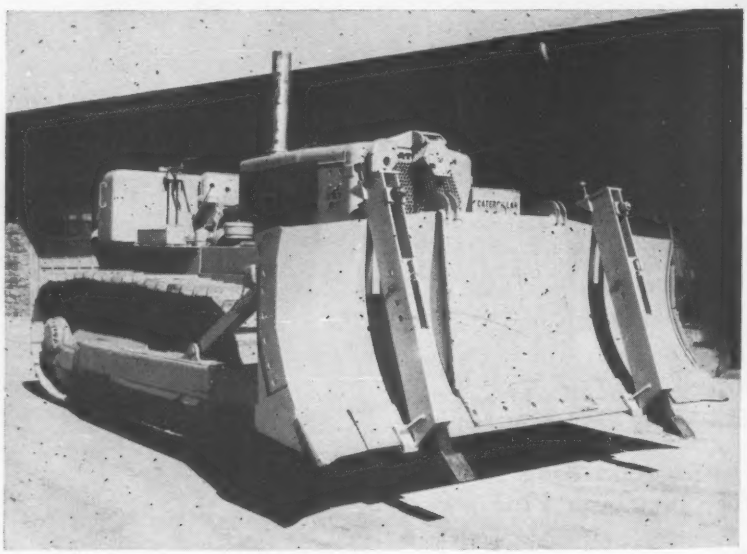




Tractor Shovel Loads in Two Directions

A diesel-powered, hydraulic loading shovel with travel speeds up to 13½ mph, can discharge its bucket either to the front or over the rear. The manufacturer claims that this elimination of normal turning and pivoting with more conventional types of shovel, cuts down maneuver time, reduces travel and speeds load-discharge cycles considerably.

The two-way loader controls discharge at both ends fully, and the height of the discharge can be varied from ground level to 9 ft in front and from 4 ft 10 in. to 9 ft at the rear. Two pairs of double-acting hydraulic rams control all bucket movements, the main lift rams incorporate a damping device that automatically slows the bucket down as it travels over top-dead center. SEABOARD EQUIPMENT CO., INC., 7 HANOVER ST., NEW YORK 5, N. Y.



Heavy-Duty Ripper for Heavy-Duty Tractors

The Model R-89 is a heavy ripper designed by the Ransome Corp. for attachment to heavy-duty bulldozer blades measuring from 43 to 60 in. high and pushed by tractors in the 150 to 320 hp range.

The ripper has a rack-and-pinion adjustment that can be made by one man, according to reports from the manufacturer.

The Model R-89 is equipped with a 4 in. by 7 in. ripping shank with a new 28 lb cast manganese steel tooth. THE RANSOME CORPORATION, 2729 HUNTING PARK AVENUE, PHILADELPHIA, PENNSYLVANIA.

This 125 cfm Gyro-Flo Compressor and PB-8 Paving Breaker combination is making short work of a heavy pavement job in a large Eastern city.

On any pavement job, you can

BREAK IT UP and FINISH IT UP

in record time with this I-R CONTRACTORS' COMBINATION

1 An I-R GYRO-FLO COMPRESSOR of the right capacity

With the complete line of Gyro-Flo rotary compressors, there's no need to haul around or pay for any more air power than you actually need. Now available in 85, 125, 210, 315, 600 and 900 cfm sizes, you can pick a unit with the *right capacity* to operate as many or as few paving breakers as the job calls for. That means no idle compressor capacity — no overloading that cuts tool pressure and slows up the work. What's more, GYRO-FLO's *proved performance* assures a smooth, dependable air supply that's tops in fuel economy and remarkably free from attention or maintenance.

2 I-R PAVING BREAKERS of the right weight and power

Ingersoll-Rand offers you the most complete line of paving breakers and accessories available today. From the big, heavy-duty, 100-lb Breaker and Pile Driver to the lightweight 20-lb Demolition Tool and Digger — you can match the *tool* to the *job*. Use only the weight and power you need — reduce operator fatigue and save air power cost. In addition, I-R paving breaker steels and accessories, designed and built to stand up longer on the toughest jobs, are available for every breaking and demolition application.

Ask your I-R representative for the complete facts on this time-saving Contractors' Combination.

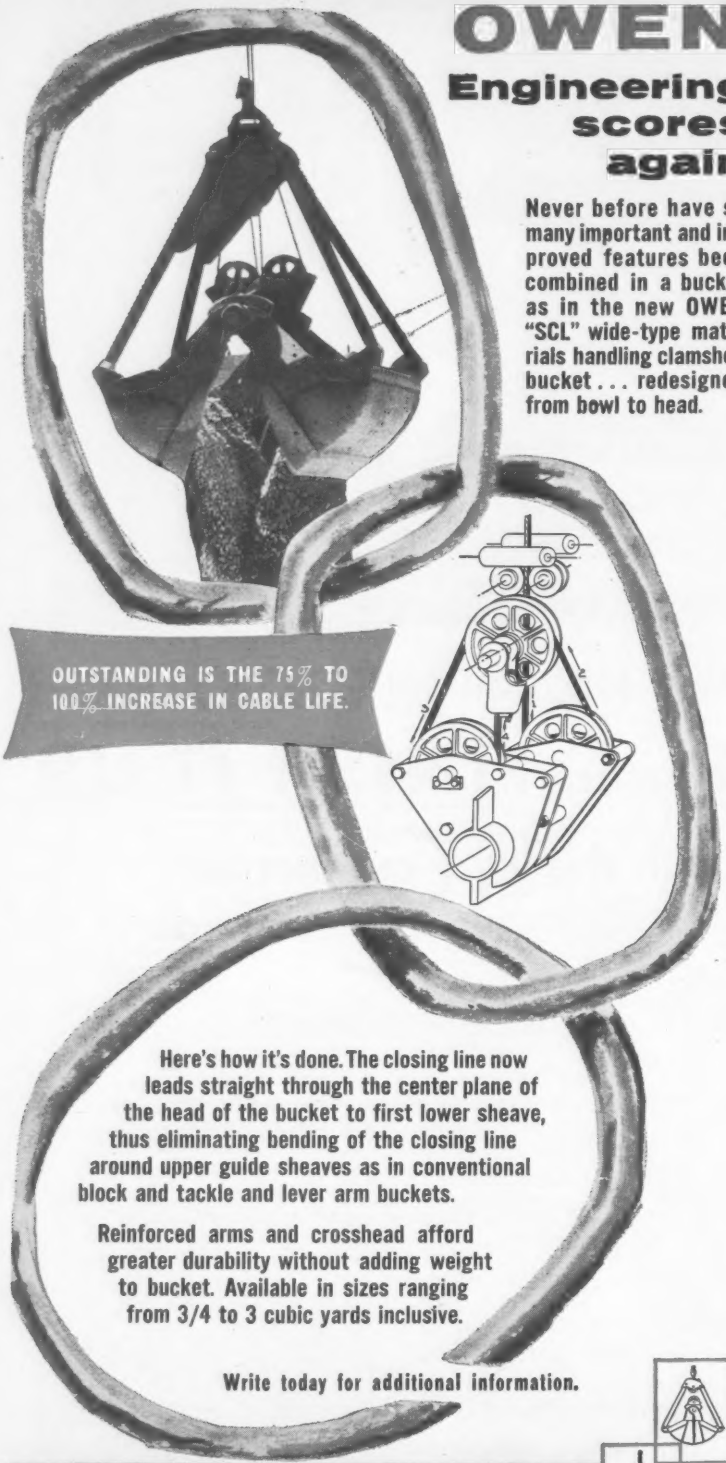
Ingersoll-Rand 14-502

11 Broadway, New York 4, N.Y.

THE BEST AIR EQUIPMENT FOR BETTER HIGHWAYS

OWEN
Engineering scores again

Never before have so many important and improved features been combined in a bucket as in the new OWEN "SCL" wide-type materials handling clamshell bucket . . . redesigned from bowl to head.

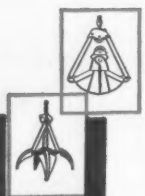


OUTSTANDING IS THE 75% TO 100% INCREASE IN CABLE LIFE.

Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle and lever arm buckets.

Reinforced arms and crosshead afford greater durability without adding weight to bucket. Available in sizes ranging from 3/4 to 3 cubic yards inclusive.

Write today for additional information.



The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

Publications

Wire Rope—A comparison table of the breaking strengths of various types of wire rope is included in a new folder on CenterFit wire rope. Folder also includes recommendations for applications of the rope on various kinds of earthmoving equipment. CENTERFIT WIRE ROPE DIV., JONES & LAUGHLIN STEEL CORP., MUNCY, PA.

Paving Plant Layouts—Plan view drawings and photos of operating concrete paving plants for highways and airports are a part of a new catalog. A one stop central mix and one, two and three stop batch truck plant operations are illustrated. Concise explanations for operation of automatic batch control and recording systems as well as bin and cement silo selection guides are other features. C. S. JOHNSON CO., CHAMPAIGN, ILL.

Dragline Buckets—A new catalog illustrates and describes lightweight, lower cost "A" series automatic dragline buckets. The catalog has sections which include explanations of what makes the bucket dig, and how the particular product achieves its digging action. PAGE ENGINEERING CO., CLEARING POST OFFICE, CHICAGO 38, ILL.

Rear Dump—Euclid Div. of General Motors has published descriptive literature on four new rear dump models now in production. The bulletins contain specifications on the units which range from 12 to 40 tons in capacity. EUCLID DIV., GENERAL MOTORS CORP., CLEVELAND 17, OHIO.

Diesel Story—Incorporation of a production diesel engine into the crawler tractor and many other notable firsts are described in a new booklet, "A Quarter Century of Diesel Leadership." CATERPILLAR TRACTOR CO., PEORIA, ILL.

Lubrication—A 24-page catalog listing the complete line of Graco convoy lubrication equipment is now available. The catalog lists all types of equipment manufactured, shows its use and its installation, with each installation and various combinations that can be made from the standard units. GRAY CO., INC., GRACO SQ., MINNEAPOLIS 13, MINN.

Gunite—A 4 page bulletin shows progress photos in Guniting typical ditches used for conveyance of water. Right and wrong examples are shown. GUNITE CONTRACTORS ASSOC., 714 W. OLYMPIC BLVD., LOS ANGELES 15, CALIF.

(Publications continued on p. 76)

LAY-SET VHS

15% Stronger • Tougher • More Wear-Resistant

67% More Wear from VHS Dragline

...for Canonie Construction Co.

• Mr. L. D. Abbey, Superintendent of Canonie Construction Company, South Haven, Michigan, says: "Our work on the excavation for the Grand Circus Park underground parking area in Detroit, Michigan, proved to us the extra toughness of new Hazard LAY-SET VHS, and the longer life you get with it.

"Our two #6 Northwest Draglines were removing 35 feet in one cut in an extremely restricted area. Because the draglines were continually dragged over broken concrete, we could only get two or three days out of the best Improved Plow Steel lines we could find. But when we switched to LAY-SET VHS we consistently got a week or more in this extremely tough service—an improvement of over 67% in service life."

New Grade of Steel—15% Stronger
New Hazard VHS Draglines are setting service records like this all over the country. Developed specifically for the toughest applications—draglines, scraper and dozer cables, shovel hoist ropes and winchlines—new VHS is made from a new grade of steel for wire rope.

This new wire rope is tougher. It resists abrasion... keeps its shape under pressure... can't become "hidebound" or lose its flexibility.

Higher Safety Factor • And new VHS is at least 15% stronger than IPS—the strongest grade formerly available. Therefore, you can handle heavier loads with the same diameter line. And you get a higher factor of safety... additional insurance against sudden overstresses.

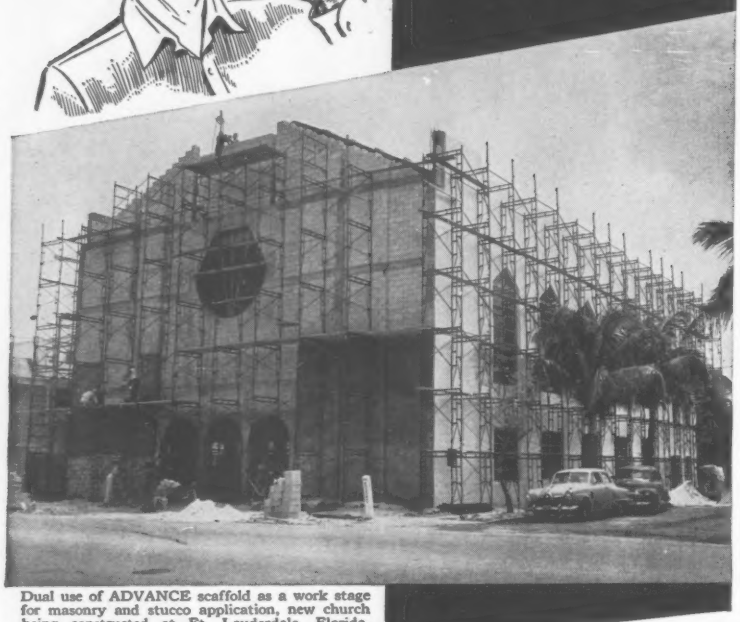
Less "Down Time"... Saves More Money
The longer life you get with new VHS means big savings. And by cutting "down-time" of equipment for wire rope replacement, you make even bigger savings.

See Your Distributor • Your Hazard distributor has in stock draglines, scraper and dozer cables, shovel hoist ropes and winchlines of new Hazard VHS. You don't need any complicated specifications to order them. Just call him today and tell him the size and diameter you want.

For more information see your Hazard distributor salesman or write to the nearest Hazard office for Bulletin DH-513H

HAZARD WIRE ROPE DIVISION
American Chain & Cable Company, Inc.
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

here's SCAFFOLD. . . . . that eyes right buys right, too!



Dual use of ADVANCE scaffold as a work stage for masonry and stucco application, new church being constructed at Ft. Lauderdale, Florida.

Clean lines . . . smart new self-locking design . . . ever-lasting usefulness — these are just some of the reasons why more and more building construction and maintenance jobs, everywhere, are being scaffolded with ADVANCE.

To general contractors and building tradesmen, ADVANCE scaffold affords a *plus value* for speed of erection, safety, durability, long life and ease of dismantling. It's specialized equipment that saves time, money and manpower on a wide range of job applications. Little wonder that ADVANCE continues to capture an ever-growing share of the scaffolding market, and that production schedules have been accelerated to keep pace with the spectacular demand.

Field-experienced BEAVER-ADVANCE engineers are readily available to supply you with working plans, bills of material and job estimates —with scaffold stocks for sale or rental available through 68 ADVANCE distributors conveniently situated in principal construction centers throughout the United States.

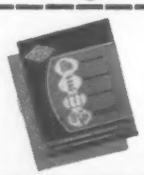
For complete details on the scaffold that will both *eye and buy right* for you, contact your *ADVANCE* dealer, or write direct.

BEAVER ADVANCE

Beaver-Advance

CORPORATION

Ellwood City, Pennsylvania



Send for this descriptive catalog, it's FREE!

BEAVER-ADVANCE CORPORATION., ELLWOOD CITY, PA.

Name.....

Company.....

Address.....

City..... Zone..... State.....

. . . Publications

Truck Loader—A bulletin describing the new M-B truck loader operation and specifications is now available. The loader is a hydraulically operated self loader adaptable to most trucks, with a jaw to reach out and draw material into the bucket so that a full load can be obtained without ramming the truck into the pile of material. M-B Corporation, New Holstein, Wis.

Dryers, Bins—A new bulletin, HH-36, describes the Model 25-T Trail-O-Dryer designed to heat and dry sand and aggregate for bituminous mixers, and the Model 5T25 dual-feeder bin for feeding aggregate into the inlet end of the dryer are described. Littlefield Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio.

Aggregate Plants—The many portable aggregate plants manufactured by Iowa Mfg. Co. are outlined in a new bulletin that shows how the plants can be set up in various combinations to produce crushed and screened aggregate to meet nearly any quantity or specification requirement. Iowa Mfg. Co., Cedar Rapids, Iowa.

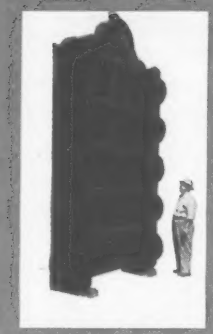
Blasting—A brochure outlines current information on drilling, blasting and excavating methods. Called "Construction Case Histories" the bulletin unfolds into a chart to present 48 detailed construction case studies in condensed data form for rapid reading and reference. American Cyanamid Co., Explosives Dept., 30 Rockefeller Plaza, New York 20, N. Y.

Carpullers—A 24-page bulletin, C-616, gives descriptions, illustrations, data, tables and specifications for carpuller requirements. It illustrates and describes the electric capstan carpuller for car moving, barge moving, pipe bending or any haulage of similar nature. Superior-Lidgerwood-Mundy Corp., Superior, Wis.

Heating-cooling units—Sizes, specifications and performance tables for a series of eight new multi-zone conditioners, which range in air-handling capacity from 1,370 to 21,000 cfm. Catalog No. 383, Acme Industries, Inc., Jackson, Mich.

Self-sealing pipe fittings — A 2 color brochure describes the True-Seal fitting, which uses a thin, nutlike fitting with a dry insert of Telfon plastic, to be threaded onto the pipe. Tru-Seal Div., Flick-Reedy Corp., 2040 N. Hawthorne Ave., Melrose Park, Ill.

(*Publications continued on p. 78*)



What is the most economical size of hoisting equipment for this gate ?

PACECO
"TAILORS OF STEEL"®

To answer this and allied questions, both in your interests and ours, Paceco is sponsoring a research study on hydraulic drawdown on large gates used in hydroelectric installations. Research is being done in the Hydraulic Laboratories of the Washington State Institute of Technology.

First phase of research covers the effect of lower lip design on the drawdown. Second phase includes dynamic testing of a model gate under full flow conditions. Final phase consists of model testing of gate with various entrances and exits.

This research is being conducted in connection with the Paceco contract with Merritt-Chapman and Scott Corporation to furnish a 540 ton capacity crane that will handle three penstock intake gates simultaneously during emergency closure at the Priest Rapids Project on the Columbia River. Each gate is approximately 20 feet by 40 feet high.

This research project is one phase of Paceco's objective—to serve industry by designing and fabricating major mechanical equipment at lowest first cost, minimum maintenance expense and highest operating efficiency.

Your inquiries and invitations to bid are invited.

Pacific Coast Engineering Company
ENGINEERS • MACHINISTS • FABRICATORS
Alameda, California, LAkehurst 2-6100

PACIFIC COAST ENGINEERING CO., INC.
NEW YORK 17, 51 East 42nd Street, OXford 7-1475

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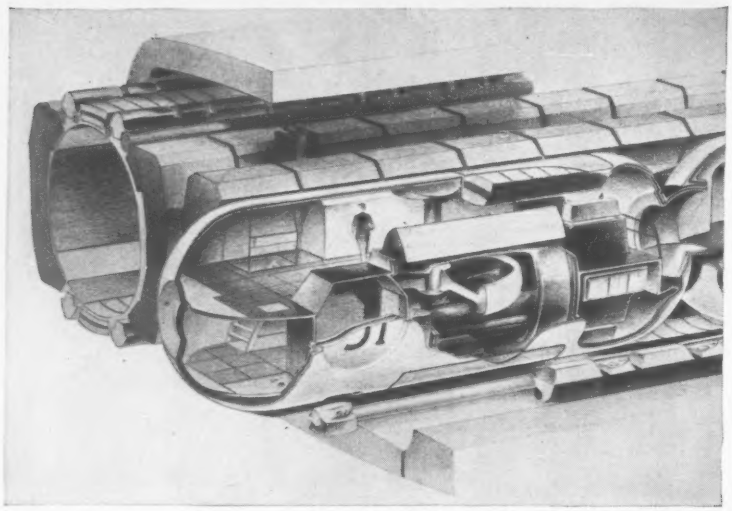
MARS outstanding design **SERIES**



man and motion:

The wonders of the future are still little whispers in men's minds, or maybe — like Detroit Designer Norman James' magnetically suspended inter-city train — a drawing on a piece of paper. Traveling in a vacuum in an air-tight tube, it floats in space, held by a system of magnets built into cars and tunnel. Propelled electrically by "rolled-out" motor, train acts as rotor, tunnel roof as stator. Converter aboard train changes light projected through windows into electrical energy.

No one knows which ideas will flower into reality. But it will be important in the future, as it is now, to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and — last but not least — the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.

The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom colored *drafting* pencil, 24 colors.

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Automatic temperature controls—Selection of proper automatic controls for heating and ventilating systems in schools and other institutional buildings; control of convector, dired fired warm air, and zone systems, unit ventilators and application of control centers for simplified installation and operation. Bulletin F 7773. BARBER-COLMAN CO., 1300 ROCK ST., ROCKFORD, ILL.

Bump Cutter—A catalog bulletin illustrates and describes a precision cutter which eliminates bumps in concrete or asphalt surfaces. CONCUT SALES, INC., 331 NORTH SANTA ANITA AVE., ARCADIA, CALIF.

Rope Uses—Photographs and drawings, with reeving diagrams, are used in a new brochure to show proper wire rope specifications for all types of construction equipment. Titled "The Correct Wire Rope for Contractors' Equipment", the brochure is available from MCWHYTE CO., KENOSHA, WIS.

Tilt-up Mixers—A catalog details the features of the Burmeister mixer with exclusive tilt-up features for use in ready-mixed plants, porto-plants, or with central mix paving. L. BURMEISTER CO., 4535 W. MITCHELL ST., MILWAUKEE 14, WIS.

Asphalt Paver—Details of the new PF-45 paver, a rubber-tired machine that is claimed to travel faster, maneuver more easily and be cheaper to maintain are given in a new bulletin. BLAW-KNOX CO., CONSTRUCTION EQUIPMENT DIV., MATTOON, ILL.

Soil Testing—The unconfined compression test for cohesive soils is described in a new testing manual written for engineering, laboratory and educational instruction use. The manual deals with interpretation, application and limitations of the test data obtained as well as with procedures and testing equipment. Standard engineering test procedures using laboratory equipment especially designed for performing the soil compression tests are outlined in the manual, which is the first of a new series to cover all major phases of testing construction materials. SOILTEST, INC., 4711 W. NORTH AVE., CHICAGO 39, ILL.

Compaction Equipment—A new illustrated 12-page bulletin, No. S-74-157, covers the entire line of road rollers and compaction equipment made by the Buffalo-Springfield Roller Co., a division of the Koehring Co. BUFFALO-SPRINGFIELD ROLLER CO., SPRINGFIELD, OHIO.

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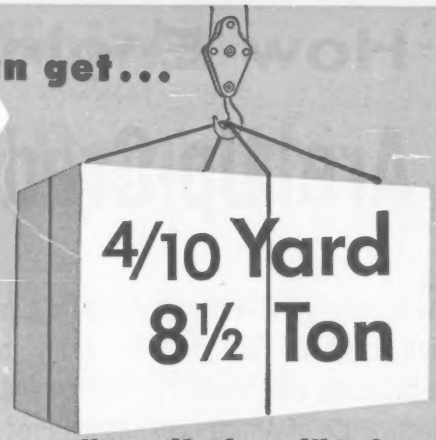
MORE!

MORE Big Shovel Features
MORE Capacity
MORE Work and Profits



at a "Small Shovel" Price

With the all new 4/10 Yard 8½ ton 85A "QUICK-WAY"®

When you can make money with a small outfit, think how much more money you can make with the husky **"QUICK-WAY"** 85A. Why be satisfied with a 6 or 7 tons in the ⅜ yard class when you can get 8½ tons in the 4/10 yard **"QUICK-WAY"** 85A—and for approximately the same price.

The new **"QUICK-WAY"** 85A has more Big Shovel Features than any other in the small shovel field. It has been engineered to meet rugged, heavy-duty specifications with fewer moving parts. The power train is oversize, all shafts are splined for easy maintenance. Extra strength has been built in the machinery frame and gantry for greater lifting power. It has been simplified for easy, economical maintenance of all parts. It operates smoothly and quietly with maximum production and minimum operator fatigue.

The All New "QUICK-WAY" Crawlers 85AC and 105AC

Now you can get the **"QUICK-WAY"** 85A and 105A on a crawler! You get the same **"QUICK-WAY"** Big Shovel Features on the crawler that gets to its job easily, stays with the work, even in close, restrictive quarters. The new **"QUICK-WAY"** Crawler has independent travel—forward and reverse speeds of ⅞ miles per hour in low range and 1¾ miles per hour in high range. It is now available in 16" crawler shoes (5.1 psi ground pressure), 24" crawler shoes (3.5 psi ground pressure), and 32" crawler shoes (2.5 psi ground pressure). Width of 95" has been especially designed for hauling on trailers.

• The Most Complete Line in the Small Shovel Field with 5 Models—105A 5/10 yd., 10½ Tons—105AC 5/10 yd., 7 tons—125A 6/10 yd., 12½ Tons—with the famous money-making line of "QUICK-WAY" attachments for all models.

1 SIMPLIFIED CHAIN AND GEAR DRIVE for efficient, quiet operation—the combination of roller chains and precision machined gears gives efficient transmission of power through the minimum number of moving parts. Standard engine 47HP @ 1800 rpm.

2 MAIN HOIST AND HAUL BACK DRUMS are mounted on a single, accessible shaft with sealed antifriction bearings. Two-piece cast laggings are easily changed. Large clutch and brake drums have separated surfaces with louvres for cooling.

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4 OVERSIZE CLUTCHES have more surface—for smoother, positive action. Hydraulically operated for easy, sure application of power, giving the operator the feel of the load at all times.

5 POWER UP AND DOWN BOOM HOIST IS STANDARD. Simple precision design makes safe, sure operation. A one-piece cast steel unit contains pawl teeth, windlass and brake drum. The cable end is located in an easily accessible place for quick attachment change-over.

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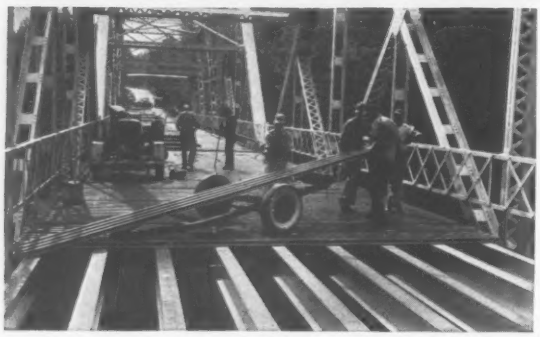
How Engineers, Contractors Are Up-Grading Local Roads to

New turnpikes and freeways make the headlines, but engineers, contractors and officials are quietly busy up-grading our local roads, too. Here is a short story of how county and state roads are becoming wider, safer, straighter, and more fit for today's traffic demands through the effective use of Armco Construction Products.



Wood Bridge Floor Gives Way to Safer, More Durable Floor

The Chenault Bridge, near Danville, Kentucky, carries State Route 34 across Dix River. Built originally with a wood plank floor, it was typical of many bridges that have remained structurally sound, yet a source of repeated maintenance, clatter, and limited loadings because their floors could not meet today's traffic demands. The solution: Armco Bridge Plank. These two-foot-wide corrugated planks are laid across the bridge and welded or bolted to the stringers to provide a firm base for a smooth bituminous pavement. They help stiffen the bridge, maintain safe floor strength. Pictures show plank being positioned on the bridge, and bituminous pavement being applied.

Economical Pile Bent Construction Used in Idaho Bridge

Outmoded bridge across the Snake River in Idaho was scheduled for replacement. The new bridge was to feature exposed pile bent construction. But the big difference was the switch from wood piles to Armco Steel Pipe Piling. Picture shows the old structure at extreme left, and Armco Piles with concrete cap and stringers in place for the new bridge. Some of the important advantages of Armco piles are their straight-driving characteristics, ease of splicing where long lengths are required, and ease of inspection after the piles are driven.

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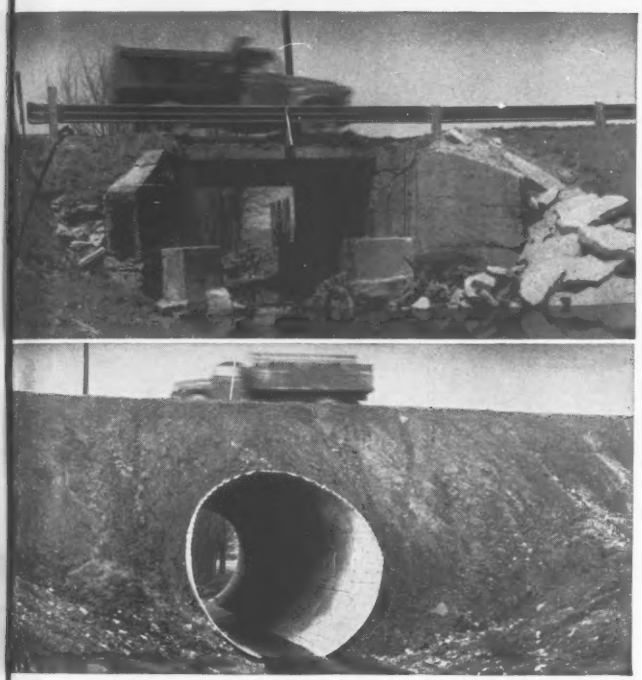

Unsafe Bridge Eliminated in County Modernization Program

Increased traffic on the Dayton-Yellow Springs road in Greene County, Ohio, highlighted need for a wider, straighter roadway. Pictures show before and after views at the site of a narrow, crumbling bridge. Armco MULTI-PLATE® Pipe plus an earth fill eliminated the old structure and provided a wider right-of-way for the road.

Write for Product Information

Complete, authoritative data on all Armco Drainage and Construction Products is yours for the asking. Write us, outlining your specific problem. Armco Drainage & Metal Products, Inc., 4387 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

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These Armco Products Help Solve Other Problems in Road Modernization

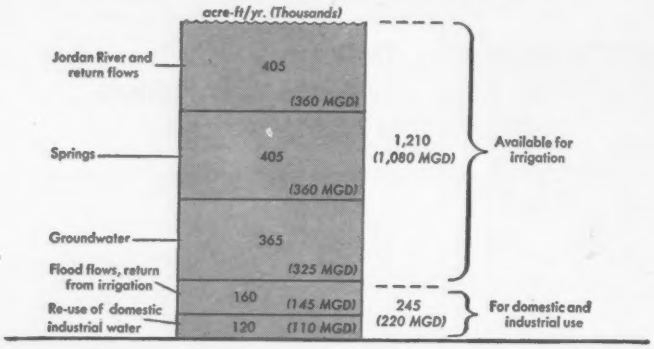
Armco End Sections are especially designed for efficient end finish for Armco Corrugated Metal Pipe and Pipe-Arch. Note how they are formed to fit the slope. Contrast this with the massive headwall treatment that frequently extends above the grade to make an obstruction on the shoulder.

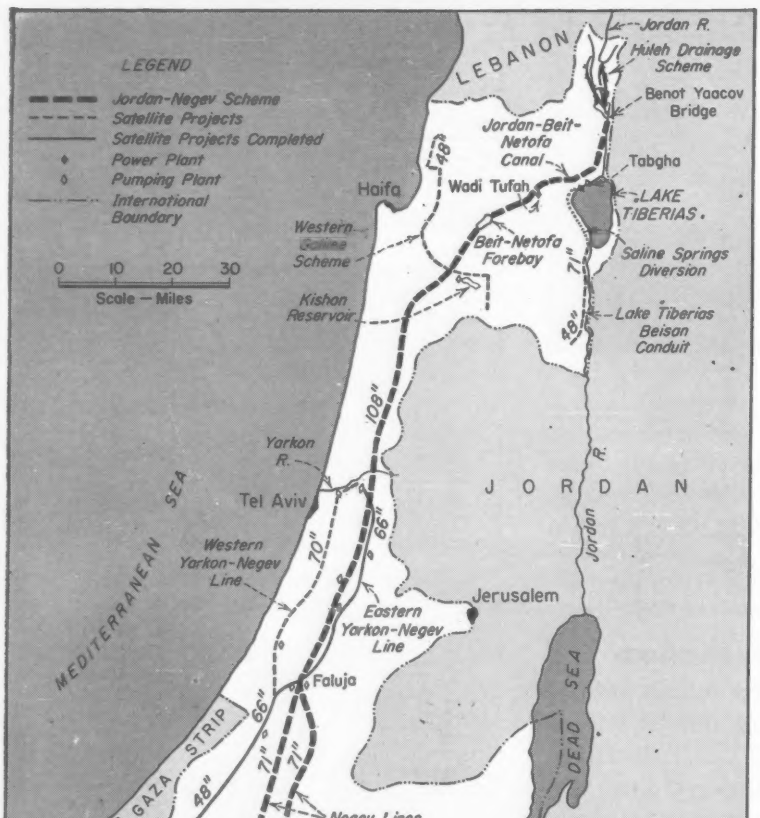
Armco Guardrail being installed on a county road in Illinois to protect motorists from steep embankment and water below.

Widening a road on a hillside can be a problem. Here an Armco Bin-Type Retaining Wall provides the solution. Bins will be filled and then more fill will be placed behind the wall to carry the wider right-of-way.

With other elements of its irrigation plan near completion, Israel readies for the ambitious Jordan River diversion

Every drop counts—from whatever source





MASTER PLAN Jordan-Negev pipeline (heavy dash-line) will unite regional irrigation schemes. Lake Tiberias, 835 ft below canal gradient, will be used for holdover storage.

Where Israel

Over the past six years Israel has quietly completed so many subsidiary elements of its master irrigation plan that it must now begin the main portion—diversion of Jordan River waters to the southern Negev desert—if benefits from the completed portions are to be fully obtained.

The nationwide irrigation network will be an engineering triumph requiring delicate coordination of both surface and groundwater supplies very much as required by a combined thermo-hydro power generation system. In dry years groundwater would be on base load so to speak, while in wet years surface water (from the Jordan River) would serve as the main supply.

The cross country transmission part of the plan involves a water storage scheme best summarized as pumped storage in reverse. Hard put to find a reservoir site near the diversion point that would not suffer from excessive seepage and evaporation losses, the Israelis were forced to turn to Lake Tiberias which lies 835 ft below the diversion canal. Power would be generated during peak demand hours as water from the canal is let into the lake. When needed, lake water would be pumped back into the canal during off peak electricity demand.

• **The master plan**—Broad objective of the water distribution scheme is to irrigate 625,000 to 750,000 acres with a water supply of 1,200,000 acre-ft per year or 1,080 mgd. This supply would

PIPELINE of prestressed concrete forms Eastern Yarkon-Negev project.

ae Will Pipe Jordan Water

be obtained as indicated in the accompanying chart. Many of these figures are rough, but conservative, estimates.

The master plan is divided into three types of projects: local irrigation schemes, five regional projects and the Jordan-Negev cross country transmission. Local schemes, utilizing wells or spring water, have largely been constructed. Of the five regional projects shown on the map, the Huleh drainage and irrigation project and the Eastern Yarkon-Negev project are almost complete and the Western Yarkon-Negev scheme and minor portions of the Jordan-Negev project are under way.

• **Systems interconnect**—All components of the overall plan are to interconnect. Main conduits from the local projects in the southern part of Israel run east-west, crossing the north-south lines from the Yarkon River. Further north, local project trunk lines run very close to the Jordan-Negev line.

Until the Jordan-Negev line is constructed, the regional schemes will operate independently. The Huleh work (described in ENR July 19, 1956, p. 59) consisted of unstopping a natural plug in the Huleh marshes to drain them and dredging 20 miles of canal (see map) which will receive swamp waters plus Jordan River flood waters.

The Yarkon-Negev projects are best described as one. Construction progress is shown on the map. All conduits are prestressed concrete, manufactured in Israel. Yarkon River water has to be pumped and this is being accomplished by underground (for security reasons) diesel stations.

Capacity of the dual system is 160,000 acre-ft per year, half in each line. At present only river water is being pumped through the completed line, but reclaimed sewage from the Tel Aviv area will be added.

Irrigation water requirements in the Jordan Valley will be met through the Lake Tiberias-Beisan conduit, a 24 mi gravity line of 145,000 acre-ft per year capacity fed from Lake Tiberias. Last of the regional schemes is the Western Gallilee project. It will utilize water from springs along the coastal area north of Haifa, purified the sewage from Haifa and floodwaters stored in Kishon Reservoir. In addition to meeting irrigation requirements, the annual 120,000 acre-ft supplied from this system will supplement Haifa's domestic and industrial water supply.

• **Main scheme**—Backbone of Israel's irrigation plan is the Jordan River diversion and connecting system to the Negev desert. Meager ground and other surface sources are now near maximum development.

Prominent components of the scheme are shown on the map. Flow of the Jordan at the Benot Yaakov Bridge, the contemplated diversion point, has averaged 445,000 acre-ft yearly and is being augmented by 53,000 acre-ft per year from the Huleh swamps.

It is planned to divert 350,000 acre-ft annually into a concrete-lined canal extending 26 mi to an operating pond at Wadi Tufah. At intake, water surface is at El 173 ft, at Wadi Tufah it will be El 121 ft.

Midway along this canal, 190,000 acre-ft per year are to be diverted into Lake Tiberias through the Tabgha power-pumping plant, which will have a gross head of 835 ft. As a power plant of 40,000 kw capacity, it will generate during hours of peak demand. As a pumping plant it will utilize off-peak power to pump water back into the Jordan diversion canal where it will flow to Wadi Tufah. A maximum of 140,000 acre-ft per year will be pumped —the remainder of the 190,000 acre-ft diverted into Lake Tiberias will supply Jordan Valley needs through the Beisan conduit.

Use of Lake Tiberias for holdover storage is a virtual necessity. Seepage tests at prospective reservoir sites on the diversion canal's gradient precluded their use. Lake Tiberias is an ideal storage reservoir since its use increases neither existing seepage losses nor evaporation losses.

The disadvantage of its low level has been overcome by the unique pumped storage scheme. Another disadvantage, presence of numerous saline springs around and within the lake, will be discounted by diverting the spring flow around the lake and discharging it into the Jordan River below the lake outlet.

At Wadi Tufah pond, 48,000 hp of pumps will raise the water through a 1.2 mi pipeline and a 2,800 ft long tunnel into the Beit Netofa Valley whence it will flow by gravity to an existing 5,700 acre-ft reservoir serving as forebay for the Negev pipeline. Difference in value of power generated and power required for pumping at Tabgha will even cover cost of the 395 ft pumping lift at Wadi Tufah pond.

• **Negev pipeline**—From the Beit Netofa reservoir, a 108 in. prestressed concrete pipeline will extend 88 mi, including 4.8 mi of tunnel to an operating reservoir at Faluja. Elevation difference of 200 ft between these two points permits a gravity flow of 195,000 acre-ft per year in the line. Flow can be increased to 245,000 acre-ft by addition of 12,000 hp of pumping station.

The Jordan-Negev line will serve as regulator of water for the entire country, being connected to floodwater reservoirs, the regional transmission scheme and the majority of local irrigation systems.

In years when Jordan River and flood flows are above average, diversion into

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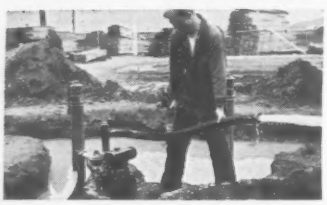
A busy and powerful Scoot-Crete dump truck, made by Getman Bros., South Haven, Michigan. A K330 Kohler Engine is used.

"Our assembly department finds that all of your engines start and run perfectly without any adjustments," reports the Pfahler Mfg. Co., Galion, Ohio. A K160 Kohler Engine operates the company's Ken-Roll shown.



This Jacuzzi contractors' type pump, equipped with a K90 Kohler Engine, is shown de-watering an excavation. Jacuzzi Bros., Inc., Richmond, Calif.

Wherever power equipment is used in construction, you'll see a steady increase in the number of Kohler Engines giving sturdy, reliable, cost-saving service.

Precision-built to Kohler quality standards, Kohler Engines insure full-rated power in a wide range of sizes, with maximum response to heavy loads, remarkable low speed performance, snappy all-weather starting. Large bore and short stroke reduce engine friction and increase piston ring life, give utmost useable power. Fully anchored magneto has easily accessible outside breaker points. All models have liberal oil capacity—pressure lubrication on the two larger sizes, K330 and K660. The K660 has tapered roller bearings at both ends of the crankshaft, smaller models have ball bearings at both ends. Sturdy compact design provides low weight per H.P. output. Special silencer muffler and large capacity oil bath air cleaner lessen noise. Smooth, balanced operation reduces equipment vibration, cuts wear, prolongs life.

Kohler branch offices are located in 16 principal cities. Sales and service organizations throughout the country have parts available and will assist you in selecting a Kohler Engine best suited to your needs. Write for information.

Short stroke • 4-cycle • Air-cooled

K90—1.8 to 3.6 H.P. K160—3.7 to 6.6 H.P. K330—8.2 to 12.5 H.P. K660—15 to 26.8 H.P. (2 cylinder opposed)

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the Negev conduit will be increased to supply water to the irrigation system for settlements en route, which otherwise receive their water from wells. This will allow some well pumping to be discontinued with consequent recovery of the groundwater table. Water so stored in the ground will be recovered by the wells and pumped back into the main conduits in years when flows are low in the Jordan.

• **Costs**—Construction of the remaining local and regional irrigation projects is estimated to cost $75 million; existing investment totals $120 million. The Jordan-Negev project is estimated at $115 million. Annual cost, at an interest rate of 3%, would be $6.8 million, or $26.40 per acre-ft. This is high under normal circumstances, but well under the benefits Israel expects to receive.

Israel's master irrigation plan was conceived by John F. Cotton, San Francisco consulting engineer. It was reviewed and approved by a board of consultants to Israel composed of H. W. Bashore, John J. Hammond, Samuel B. Morris, John L. Savage and Abel Wolman, chairman—all of whom are leading American engineers. This board also sees no conflict between the Israeli plan and the Eric Johnston plan for division of Jordan's river waters between Jordan, Syria and Israel.

El Salvador and Honduras Plan International Highway

El Salvador and the Republic of Honduras have come to an agreement regarding construction of a highway from San Salvador, across the border, to the Honduras Caribbean coastal port of Omoa, it was announced last week.

A treaty between the two countries clarifying details is under negotiation, it was said, therefore details of the highway route and of financing have not been disclosed.

El Salvador is now and always has been dependent on the Guatemalan port of Puerto Barrios for import and export shipments through the Caribbean Sea.

This in turn has forced shippers to be dependent on the International Railway of Central America for transportation to and from Puerto Barrios and it has been repeatedly charged that rates are "the highest in the hemisphere."

The alternative is to ship through a Salvadoran Pacific port which involves transit through the Panama Canal to the U. S. or Europe with the attendant costs.

(*International continued on page 86*)

Nationwide service on Bitumuls & Asphalt for every paving need...all from one source!

PENNSYLVANIA: Laykold® Asphaltic Concrete solves a tough paving problem on the Liberty Bridge, a major approach to downtown Pittsburgh. (When it comes to pavements, bridges are notoriously "bad actors" because expansion and contraction of the deck result in an unusual degree of movement under the surfacing). Based on previous use of Laykold Asphaltic Concrete, Department of Public Work officials for Allegheny County knew that this material retained an extra measure of resilience after placement and compaction, with no decrease in load-bearing value.

Mixed with slag aggregate, a 120 lb. "LAC" binder course and a 100 lb. "LAC" surface course were placed over an area of some 32,000 sq. yds. Trumbull Construction & Asphalt Company of Pittsburgh did the work. American Bitumuls & Asphalt Company supplied the asphalt and the Laykold Tempering Fluid.

Results to date: excellent service; no pavement failures.

CALIFORNIA: Across the nation, on the Pacific Coast, the State of California Department of Highways let a half-million-dollar contract for re-surfacing 41 miles of U. S. Highway 99 to the Schroeder Company, of Sun Valley, California. For this job, American Bitumuls & Asphalt Company supplied: 1,700 tons of Air Refined Asphalt; 3,500 tons of Paving Asphalt; 140,000 gallons of Bitumuls® Emulsified Asphalt.

LOUISIANA: While "down South," on the construction of a road for private industry at Grand Isle, La., American Bitumuls & Asphalt Company supplied Bitumuls Emulsified Asphalt for 20,000 sq. yds. of 3-course surface treatment work on which *clam shells* were used as aggregate. As cover aggregate, shell produces a long-wearing surface.

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HYDROELECTRIC PROJECT HEADWORKS consists of free spillway (extreme right) supplemented by controlled spillway section. Intake on near shore diverts water into collector canal and into dual-basin sandtrap (foreground). Then it goes to power tunnel.

Paucartambo: Power for Peru's Mines

STEEL PENSTOCK emerges from 8 mile long tunnel and makes 3,750 ft long plunge to powerhouse at foot of the mountain.

Inaugurated last month, the $31 million Paucartambo hydroelectric project in Peru is a private facility owned by the Cerro de Pasco at La Oroya. The project's 65,000 kw capacity, later to be increased to 100,000 kw, is to be used for the company's zinc and lead mining and refining activities.

To supply this new power for Cerro de Pasco, whose zinc-lead mines are among the largest in the world, the turbulent Paucartambo River has been dammed at a site in the Paucartambo Valley known as Yuncan. From there, the water is carried by an 8 mile long tunnel to the powerhouse site at Yaupi Alto. The river, whose source is in lakes high in the Andes, is further swollen in the rainy season by waters from tributary streams.

• **Headworks**—To utilize what is essentially a run-of-the-river flow, the headworks at Yuncan consists of a 130 ft long free spillway built of masonry and cyclopean concrete fill. This is supplemented by a controlled spillway section equipped with two steel 50 ft tainter gates.

On the right bank of the river is a 240 ft long intake structure made up of 5 intake gates and 2 bypass gates set into a heavy concrete barrier with operating bridge on top. The intake gates are capable of diverting 1,000 cfs of water into a 143 ft long collector canal. The canal leads the water to a dual-basin sandtrap, 350 ft long and 180 ft wide. Either section of the trap can be bypassed while cone valves installed at the sides are used to sluice out accumulated sediment.

The water then enters a forebay or basin which extends 150 ft into the tunnel entrance to regulate flow of water into the tunnel.

• **Tunnel and penstock** – The 8 mile long tunnel from the headworks to the powerhouse site is horseshoe shaped with a mean diameter of 13 ft.

The tunnel was worked at from six faces—entrance, outlet and two adits. It is blasted out of granodiorite for

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two-thirds of its length and conglomerate and metamorphic sediments for the remainder. The entire tunnel invert is paved with concrete and 60% of the tunnel is completely lined. Tunnel outlet is at Yaupi Alto.

At that point, a steel penstock, 3,750 ft long, leads down to the powerhouse, maintaining an average slope angle of 25 deg as it drops down the mountainside. The penstock is made up of 30 ft sections of pipe, with an inside diameter of 79 in. at top reducing to 71 in. at the bottom. The sections are joined by flexible coupling.

The steel penstock penetrates some 300 ft into the tunnel outlet, and is equipped with a butterfly valve. A surge chamber excavated out of rock connects with the tunnel about 170 ft upstream from the valve.

• **Powerhouse**—At the powerhouse end, the penstock branches out into three tubes of 43 in. diameter. They enter a powerhouse built of reinforced concrete columns and beams with concrete block curtain walls. At present, the structure measures 40x213 ft and is 46 ft high. However, one wall can be removed easily for future lengthening when more units are added. An additional penstock also is contemplated to serve the extra units.

The generating units now installed are three horizontal impulse type turbines, subject to a net effective head of 1,580 ft, running three generators of 21,600 kw each. Two more units are planned for the future.

• **More water**—The flow of the Paucartambo is subject to wide seasonal fluctuations. To partially overcome this limitation, dry season flow of the river will be supplemented by diverting the Manto River into the main tunnel—at about the tunnel's midpoint—using a diversion dam there; and by diverting the Santa Isabel River, which joins the Paucartambo about 250 ft below the headworks, into the pond above the dam.

Access to project sites in Peru usually presents a big problem to the builder. This was true for Paucartambo also, which is about 6,000 ft above sea level. To get to the work site, some 65 miles of access road—accounting for $5 million of the project's $31 million cost—had to be built through rugged terrain. To get the generated power to Cerro de Pasco's mines at La Oroya, some 90 miles of transmission line were strung.

Design and resident engineer for the Paucartambo project was Ebasco Services, Inc., of New York, with T. N. Creacy as project manager.

British Begin Work on Thames River Tunnel

Driving of a main tunnel under the Thames to link Purfleet, in Essex and Dartford in Kent, started late in March, according to G. H. R. Nugent, Joint Parliamentary Secretary of the British Ministry of Transport.

The start of work was signalled by securing the first cast-iron ring of more than 2,500 such rings which will be erected as the tunnel is driven. The $35 million project is expected to be completed by 1962.

Present contract will see the driving and lining of the 4,700 ft long main tunnel and construction of immediate approaches of almost a third of a mile in cuts. Shield driven, the tunnel will have a 35-ft dia, driven through chalk which will require constant air pressure. When completed the internal diameter of the main tunnel will be 28 ft 2 in. and it will house a 21 ft two-lane roadway with a minimum of 16 ft headroom.

Britain Grants Funds for Nigerian Road System

The British Government has granted the Federation of Nigeria more than $3 million from Colonial Development and Welfare funds for improvement and extension of the Nigerian Federal Trunk Road System. These roads consist of more than ¼ of the country's 32,000 miles of road and are considered to be of international and interregional importance.

The grant approved will be used to meet 50% of the cost of certain items in the five-year program—surfacing and improving of 451 miles, bridges, provision of added ferries at unbridged river crossings and reconstruction of certain existing roads.

Tallest Office Building To Be Erected in London

Work will start soon on what will be central London's tallest office structure. The controversial New Zealand House will be 225 ft high, 41 ft higher than Nelson's monument, but far short of the 365 ft St. Paul's Cathedral. There has been considerable opposition to the height of the proposed building.

The structure, located in the Strand, will have a base of four stories and a slender rectangular tower of 13 floors and a penthouse. A garage in the basement will accommodate over 70 cars.

The building will cost about $5.6 million. Robert Matthew, professor of architecture at Edinburgh University, was the architect.

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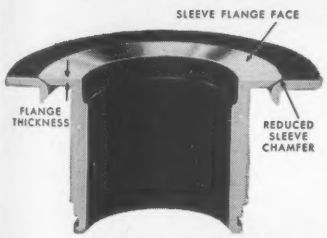
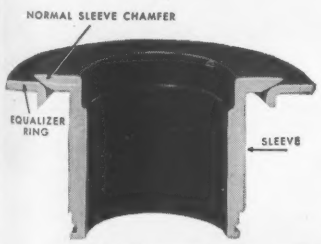
In Field-Rebuilt Clutch Sleeves All That Shines Is Not New



SHINY CONTACT FACE on re-ground clutch sleeve indicates unprotected soft iron surface.



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Ordinary clutch rebuilders just don't have the resources or the expensive equipment needed to recondition clutches the Lipe quality way. Some rebuilders even use unskilled labor, too few new parts and inadequate inspection methods: Practices that naturally lower the quality of the rebuilt clutch and shorten its service life.

At left is a typical example of inadequate reconditioning. Instead of replacing, as Lipe does, a worn or scored clutch sleeve with a new one, the rebuilder re-grinds the surface down through the case hardening to the soft metal beneath. That means the sleeve will wear quickly, and cause serious damage to the throwout bearing and a high rate of destructive slippage — *all greatly reducing the life of the clutch.* Such an improperly rebuilt clutch tested recently showed a total direct pressure loss of 120 lbs.!

Slipshod reconditioning always costs more in the long run. It pays to get genuine Lipe Factory-Exchange Tagged and Sealed Clutches. Contact your nearby authorized Lipe jobber for quick exchange service.

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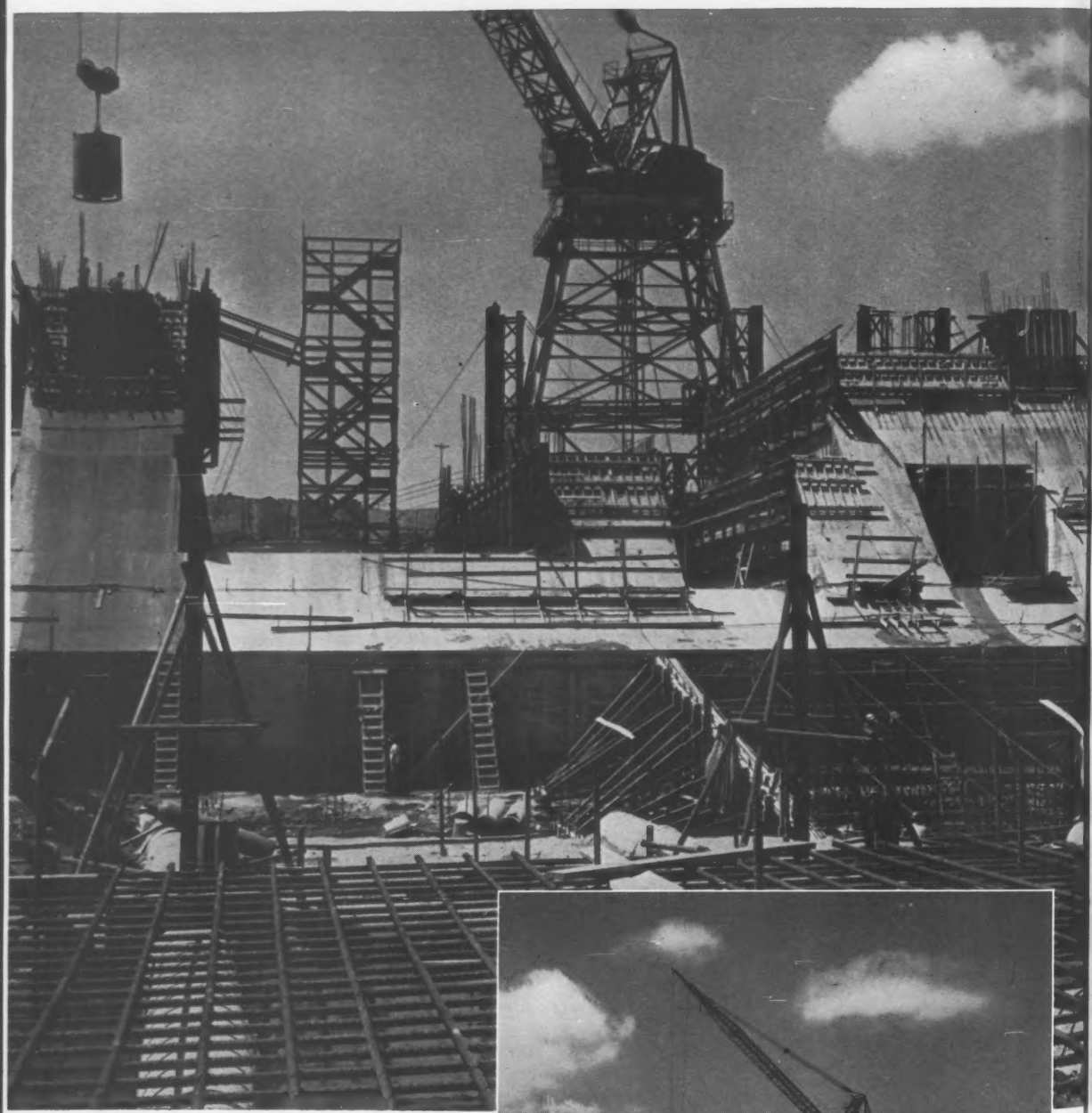

Long Sault Dam is being constructed one half at a time. Maximum height will be 145 ft above foundations. Contractors: Walsh Construction Company, sponsor, with B. Perini and Sons, Morrison-Knudsen Co., Peter Kiewit Sons' Co., and Utah Co.

s oncrete for St. Lawrence Power Project

During the summer the huge concreting operations at the International Rapids section of the St. Lawrence power project were going full speed ahead. The project entails a total of some 3,000,000 cu yd of concrete, the bulk of it in four major jobs: the Barnhart Island powerhouses, Long Sault Dam, Massena Intake and, upriver, Iroquois Dam.

These pictures show the placing of concrete at the first three of those jobs. Largest single one is the Barnhart Island powerhouses, a massive steel-reinforced structure 165 ft high, designed as a modified outdoor-type powerhouse with superstructure eliminated. A giant gantry crane will traverse the length of the powerhouse, which straddles the international border. The crane will facilitate major repairs by removing generators through rolling hatch doors. For the portion of this job on the U. S. side of the boundary, Bethlehem is supplying some 18,500 tons of steel reinforcing bars.

Long Sault Dam is a conventional gated ogee spillway structure, curved upstream. Nearly 1800 ft long, the dam will have a maximum height of 145 ft above foundations. Long Sault Dam, entirely south of the border, is being built one-half at a time.

Massena Intake is a gravity concrete structure with a pumping plant. It will permit the continuous flow of water for domestic and industrial purposes to Massena, N. Y., during construction operations along the river.

In all, Bethlehem is supplying over 23,000 tons of steel reinforcing bars for these three jobs. The St. Lawrence power project is being constructed jointly by the Power Authority of The State of New York and the Hydro-Electric Power Commission of Ontario.

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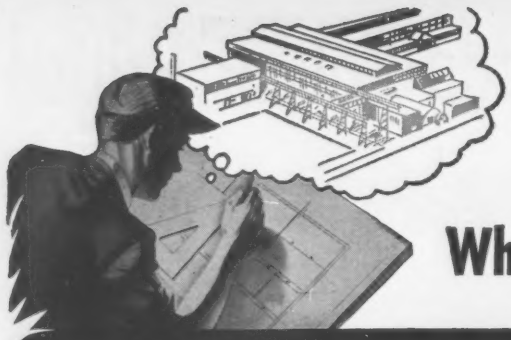
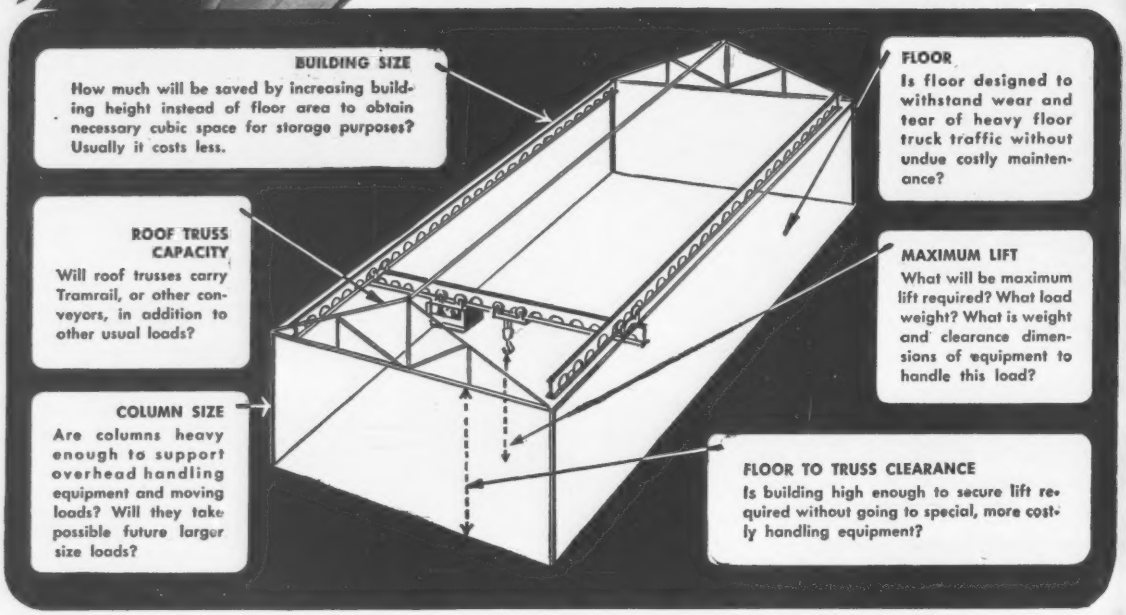
Barnhart Island powerhouse is largest single St. Lawrence construction project. Contractors: B. Perini and Sons, sponsor, with Walsh Construction Co., Morrison-Knudsen Co., Peter Kiewit Sons' Co., and Utah Co.

Construction at Massena Intake. Contractors: Morrison-Knudsen Co., sponsor, with B. Perini and Sons, Walsh Construction Co., and Utah Co.



Don't Forget *Materials Handling* When Designing the Building


BUILDING SIZE
How much will be saved by increasing building height instead of floor area to obtain necessary cubic space for storage purposes? Usually it costs less.
FLOOR
Is floor designed to withstand wear and tear of heavy floor truck traffic without undue costly maintenance?
ROOF TRUSS CAPACITY
Will roof trusses carry Tramrail, or other conveyors, in addition to other usual loads?
MAXIMUM LIFT
What will be maximum lift required? What load weight? What is weight and clearance dimensions of equipment to handle this load?
COLUMN SIZE
Are columns heavy enough to support overhead handling equipment and moving loads? Will they take possible future larger size loads?
FLOOR TO TRUSS CLEARANCE
Is building high enough to secure lift required without going to special, more costly handling equipment?

The foremost demand of a new factory building, whether for production or storage, is that its design and construction aid overall operating efficiency to the utmost. Thus, the building becomes more than just an enclosure, but is actually a vital part of the manufacturing process.

It is, therefore, imperative that the various steps entering into the making of an item be thoroughly considered when the building is designed. One of the most important of these concerns materials handing because this item often amounts from 25% to 50% of the total production cost, and, also, because it is plant-wise in nature.

Regardless of what handling methods are deemed best, overhead cranes or Tramrail, roller or chain conveyors, floor trucks, etc., the building design, size and construction usually has a tremendous bearing on the ultimate handling efficiency secured. Building clearances, floor construction, column locations, aisleway allowances and other factors must be considered for the different handling methods for most satisfactory results.

For initial economy in installation, for most satisfactory operation and highest efficiency, plan for materials handling when you design the building. ***Do not make materials handling an afterthought.***

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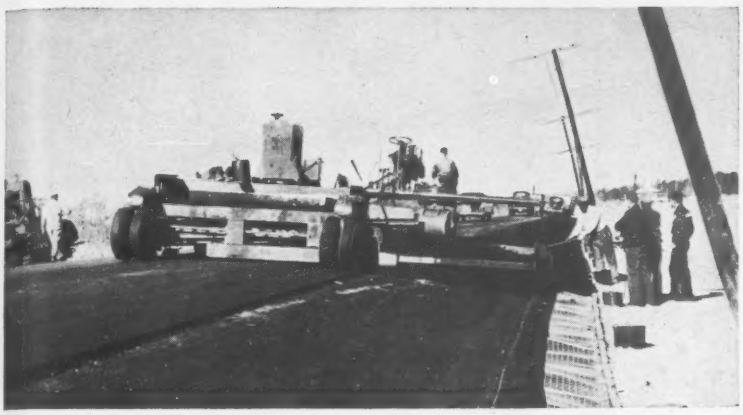
OVERHEAD MATERIALS HANDLING EQUIPMENT



Reinforced Toes Guard Causeway

Determined to prevent recurrence of washouts after heavy storms, the Maryland State Roads Commission during the past winter installed wire-reinforced asphalt toes in the shoulders on both sides of the 2,200 ft long causeway connecting Point Lookout to State Route 5, near the mouth of the Potomac River.

Since 1933, state records show, the causeway has been damaged five times by heavy ocean storms. Most serious damage occurred after "Hurricane Hazel" in 1954, when waves from Chesapeake Bay broke through to enter Lake Conboy, west of the causeway, opening a channel 30 ft wide and 8 ft deep.

The job consisted of first driving heavy, treated timber sheeting at the toe of the slope, tacking to the inside of this sheeting continuous lengths of 2½ ft wide rolls of welded wire fabric and anchoring the fabric by bolting timber wales above them. With the fabric standing upright, 2 in. of asphaltic concrete was put down on the 4 to 1 slopes. Then the fabric was bent over this layer, and additional 2 in. of paving put down and rolled smooth.

Paving was done with a conventional shoulder spreader, which carried a small water-filled lawn roller in its leading edge to "iron out the 2½ ft fabric strip as the spreader approached. Compaction was done by a small roller, wired to a heavy grader in order to maintain itself without slipping on the steep slope.

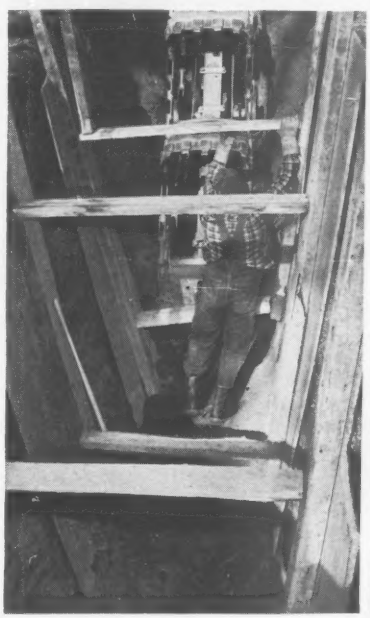
On the bay side of the causeway, additional strength was built into the protective works by backing up the sheeting and wales with 12 in. timber piles, driven to 10 ton bearing capacity on 20 ft centers.

Albert L. Grubb, chief engineer for the commission's bureau of Bridges was in general charge of the work, under Norman M. Pritchett, chief engineer of the commission. Bituminous Construction Co. of Baltimore, was contractor.

Plywood Shoring

Workmen follow trencher and place light panels

Fir plywood panels, 4x8 ft and ⅝ in. thick, are used to shore up the dirt walls of sewer excavation ditches on a Long Island job. And according to the



Grace
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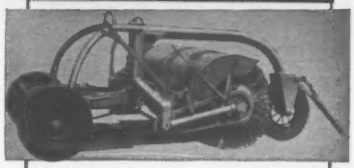
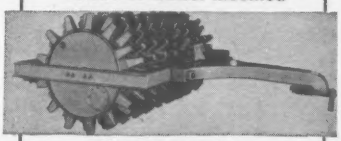
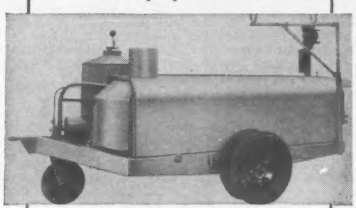


Roadsweepers, traction, engine-driven or tractor-mounted



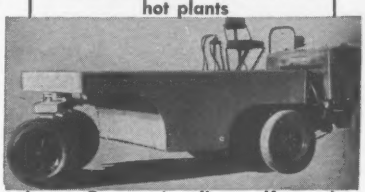
Sheepsfoot rollers

Chip spreaders



Circulating asphalt heaters

Automatic oil heaters for hot plants



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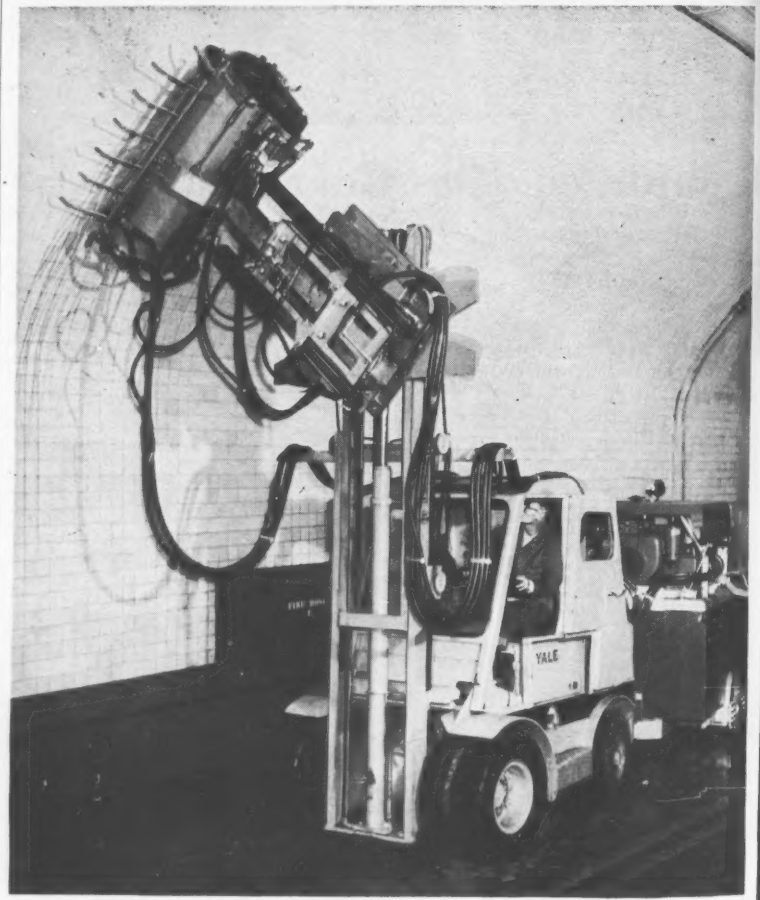
contractor, Zara Contracting Co., Hicksville, N. Y., the firm is saving money on material costs as well as labor.

The panels are spaced every two feet, replacing the older method of 2x10 in. shoring stock every four feet. The panels are placed upright in the ditch facing each other, immediately following the trencher. Eight-foot vertical 3x8 in. uprights are nailed to the center of each panel. Horizontal walers, 5 ft lengths of 3x8's, are forced between the uprights so that they run across the trench about 2 ft below the top of the plywood panels. Three-foot 2x8 in. horizontal walers are then forced into the same position about 3 ft from the bottom of the panels. All walers are nailed.

As each section of sewer pipe is installed, the bottom waler is removed to permit the pipe to be placed. The plywood sheeting can be taken up and reused again and again. The panel system makes it possible, according to the contractor, to cut out two men on a crew of ten and a foreman on a trench machine crew.



Fork Truck Becomes Tunnel Scrubber

A specially designed machine, said to be the only one of its kind, has been built for the Mobile City Commission to speed washing of the tile walls of the Bankhead Tunnel. Use of the machine is said to have cut the tunnel's "wash day" from a total of three weeks to three or four nights.

The machine is made up of three basic units—a 44 in. nylon brush, a lift truck with hydraulic controls to place the brush at almost any angle, and a tank trailer carrying 650 gal of water and 80 gal of detergent, enough for one trip through the 3,000 ft tunnel.

Designed by Palmer & Baker, Inc., consulting engineers for the tunnel, the machine was manufactured by Ross and White Co. of Chicago at a cost of about $29,000.

(*F&O continued on page 96*)

Cyclotherm Division, National U.S. Radiator Corp., Oswego, N. Y., increases drafting room output with Kodagraph Autopositive Film intermediates. These extremely translucent "masters" also produce sharper prints for this leading manufacturer of oil- and gas-fired steam and hot water generators.

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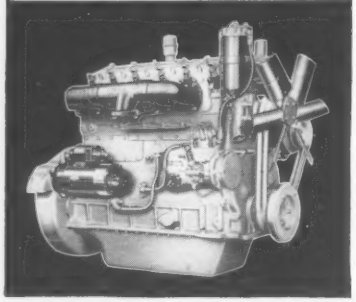
135-DKB Diesel—4¼-in. bore x 5-in. stroke; 426 cu. in. displacement, with counterbalanced crankshaft. Get Bulletin 1573.



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Safety Comes First

Constant caution is key to low accident rate in the Missouri River Basin

Not one fatal accident in 16 million manhours of exposure and $153 million worth of construction is part of the safety record racked up by contractors working on Corps of Engineer projects in the Missouri River Basin during 1956. And an accident frequency rate of 5.14 and severity rate of .13 were the lowest since the Corps' safety program began in the Missouri River Division 23 years ago. These compare to National Safety Council Construction Section rates of 17.28 and 2.29.

The key to low accident rate is concern with safety from job planning through job completion, the engineers point out. Safety is engineered into jobs in the planning and design stages, while safety requirements are incorporated in the general and special conditions of all contracts. And half-measures are avoided. The extensive safety program includes:

- A written safety plan is required from each contractor, reviewed and approved by the contracting officer prior to start of work.

- Pre-construction safety conferences are required with contract management and supervision, and periodical safety meetings are conducted by contractors' foremen with their work force.

- Contractors are encouraged to include a safety requirement in their agreements with subcontractors.

- Government inspectors are required to attend all job safety meetings and act as liaison officers between contractors and the resident engineer who coordinates the entire job safety program. Inspectors are required to be continually alert for hazardous conditions and to enforce safety requirements set down in the contract specifications.

- Before each hazardous phase of the work is started, a safety meeting is held with all workmen to be engaged in the operation and they are informed of unsafe conditions they may encounter. Before these meetings, job engineers and supervisory personnel strive for erection methods that will eliminate all foreseeable hazardous conditions.

The safety records these rules helped bring about are especially impressive since much of the work involved is in the high hazard category.

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one of the world's largest
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Right now, limited quantities of Olin Aluminum are being produced at four locations, and soon an initial annual capacity of 240 million pounds will be a reality.

Benefiting from Olin Mathieson's already extensive experience in the metals field, Olin Aluminum will become a major source of unusually fine-quality Aluminum. And as a result of its full integration—from Bauxite to rolling mill—Olin Aluminum will be in a position to assure its customers a *dependability* of delivery that will be of vital importance.

A New Concept of Service Standards

Of equal significance is Olin Aluminum's new concept of service standards. Its new plant facilities will be the finest, most modern in existence—thus assuring the ultimate in production quality and economy. Its technical staff is composed of men of broad and extensive experience—ready to work side by side with your own engineers toward the one best solution to any of your Aluminum problems. And Olin Aluminum's new sales team consists of men with a minimum of five years of thorough experience in the Aluminum field.

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OLIN ALUMINUM

sonnel—will result in Aluminum of competitively superior metallurgical quality, tolerances and finishes.

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Behind the birth of Olin Aluminum lies an exciting industrial drama. Recognizing the growing world need for Aluminum, Olin Mathieson—already greatly experienced in the production of non-ferrous metals through its Western Brass Mills Division—joined with Revere Copper and Brass to organize the Olin Revere Metals Corporation. The purpose of this united effort was to construct and operate the complete facilities necessary for the production of primary Aluminum. The Olin Revere Shipping Corporation was formed to import the huge quantities of Bauxite needed, and keels were laid for its three giant new 16,000-ton ore ships of revolutionary design.

Simultaneously, at Burnside, Louisiana—an ideal deep-water port—construction was begun on a large new Alumina plant. And on the Ohio River, at Clarington, Ohio, work was begun on the first reduction plant ever to have its own integrated coal supply and power-generating facilities. These new plants, fruits of a $300 million investment, form the assured source of supply for Olin Aluminum.

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Two-thirds of the output of this fully integrated primary Aluminum production system will go directly to the new Olin Aluminum Rolling Mill at nearby Omal, Ohio, and to other Olin Aluminum facilities in the Midwest, on the West Coast and on the Gulf Coast. From these modern plants will flow custom-made Aluminum better adapted to your individual needs than any you have ever before been able to obtain. That is the goal of Olin Aluminum: a new concept of quality and service in the Aluminum Industry.

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and to explain how custom-made
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Big New Name in Aluminum

AND "OLIN ALUMINUM" ARE TRADEMARKS

NAHB Builds Test House For Research on Materials

The Research Institute of the National Association of Home Builders will build an experimental 1 story basementless house to test new materials and construction systems. The study will enable builders and manufacturers to check performance characteristics of new materials and construction techniques, and, if they prove satisfactory, stimulate their quick adoption and use.

The test house, which will have three bedrooms and two baths, will incorporate:

- **Exterior**—Siding of a new preformed hardboard not yet on the market. Roofing of 4x13 ft plastic-on-plywood sheets nailed in place, calked with plastic and roller coated with the same type of pebble-textured plastic used for calking.
- **Interior**—32 ft 8 in. glue-nailed trusses supporting the roof. Flooring of ⅛ in. thick buckle-resistant hardwood, applied by mastic to the concrete floor slab. Partitions will be dry-wall.
- **Heating-cooling**—A factory-sealed cooling unit that can be installed with the heating system or later. Ducts in the slab will move the conditioned air to flush floor outlets under windows.
- **Bathroom**—A wall mounted water closet and elevated bathtub to keep supply and drain lines above the slab.

Following initial testing, the home will be opened for inspection to builders and manufacturers. It then will be sold and occupied under an agreement that will allow inspection and evaluation of the new features for a number of years.

The project is expected to spur development and acceptance of new building materials and techniques.

Why Do Buildings On Clay Foundations Settle?

Some light is being shed on one of the causes of building settlement by research being conducted by the Division of Building Research of the National Research Council of Canada. Begun in 1954, the investigation seeks an explanation of damage caused by differential movement to houses built on clay soils.

An area three blocks by twelve in Ottawa was chosen for study. The houses, for the most part, were 2½ story, 60 to 80 year old brick structures resting on heavy stone foundations. Almost every structure had suffered differential settlement ranging from 1 to 15 in. The soil consisted of a deep Leda clay deposit topped with 6 ft of fine sand.

An extensive shallow boring program revealed that the moisture content of soils was always lowest at points at maximum settlement. Surveys showed that in almost every instance, settlements were greatest in that part of the structure nearest trees and streets.

The results have shown that ground movements are dependent upon climatic conditions and aggravated by the presence of trees. Settlements start in the spring when leaves appears and the water table starts to drop. Peak settlement is reached when the water table is at its lowest in late summer. Autumn rains raise the groundwater table with a consequent raising of the ground surface.

A laboratory testing program has been started to study the shrinking and swelling properties of the Leda clays in the Ottawa region. Results of this study to date indicate the differential movement is not completely reversible when severe moisture content changes occur.

USGS Gages Groundwater Seepage to Surface Streams

The U. S. Geological Survey thinks it has developed an improved method of accounting for water gains and losses in drainage basins. It features a rating curve permitting approximation of the amount of water contributed to a stream by groundwater seepage.

The method involves periodic determination of significant factors such as precipitation, streamflow, storage of water in the stream channels, groundwater level and soil moisture. It also calls for a statistical analysis of factors not so readily measurable, such as the changes in groundwater storage and the amount of water evaporated from the soil and transpired by vegetation.

As a part of the statistical analysis, a rating curve was devised that permitted the approximation of the amount contributed to a stream by groundwater seepage. This development, in turn, led to a better estimate of the total discharge of groundwater by runoff to streams, evaporation and transpiration, and addition to storage in the ground.

Test results of the new method—from a pilot study of a small drainage basin near Salisbury, Md.—can be obtained in a USGS report made available in typewritten form last month. The report, "Hydrologic Budget of the Beaverdam Creek Basin, Maryland," is to be published soon.

To solve the storage problem in this plant, storage bins along two walls were extended to the ceiling. But to reach the upper level of bins, it was necessary to use a long hazardous ladder.

Safe and easy access was achieved by installing a mezzanine made of open metal grating, midway between the ceiling and the floor. The mezzanine is reached via a stairway also made of grating.

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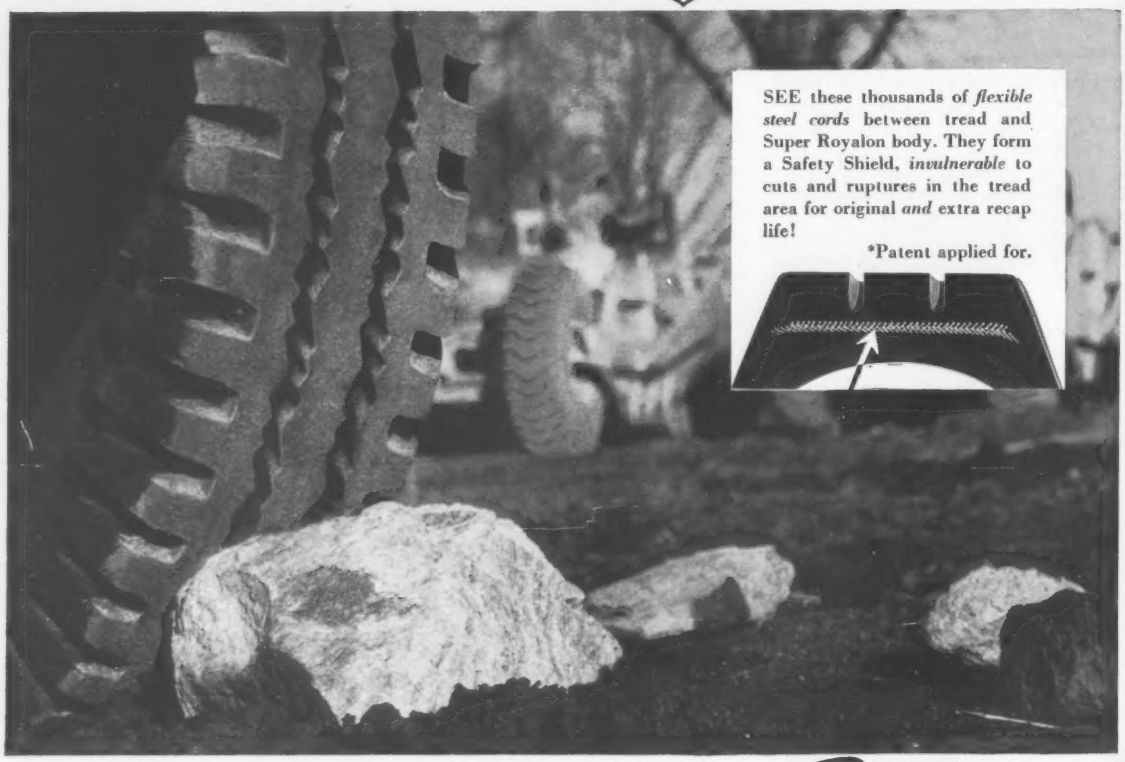
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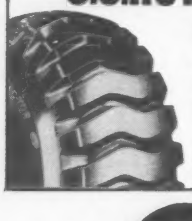

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Danish expert, new to Florida . . .

Heads Coastal Engineering Course

A complete course in coastal engineering leading to a master's degree is the plan in preparation at the College of Engineering, University of Florida, Gainesville. It would be the first such course in the U. S. And a Dane named Per Bruun is the man important to the scheme.

A noted European hydraulics expert, Per Bruun joined the university staff immediately upon his arrival from Denmark in 1954. He heads the coastal engineering division of the college's Department of Engineering Mechanics and its Engineering and Industrial Experiment Station. In addition, much of Professor Bruun's efforts go beyond Florida's borders in the form of consultations with national, state and local authorities both here and abroad.

Researcher Bruun's major Florida project at the moment is directing a study to determine the effect on the Lake Worth water table if Lake Worth Inlet should be deepened (ENR Mar. 28, p. 79). Planner Bruun recently recommended to the state legislature that a $600,000 modern coastal engineering laboratory be established (ENR Mar. 28, p 80).

• **Europe to Florida**—Per Bruun comes to the U. S. with a distinguished career in beach erosion work in Denmark and elsewhere in Europe. Now 40 years of age, he has spent 16 years in practical work, following his graduation in 1941 from the Technical University of Denmark as a master of science in civil and structural engineering. A doctorate from the same school was acquired in 1954.

From 1941 to 1949 Per Bruun worked with the Danish Ministry of Public Works on waterfront structures. Then for five years he lectured and did research work, at his former school, on littoral drift and coastal protection problems. Consultant Bruun also has worked on coastal problems of Turkey, Iceland, Venezuela, Colombia and Nicaragua. And recently he was called in as advisor to the U. S. National Park Service on beach erosion problems near Cape Hatteras.

In Florida—which Per Bruun selected because, as he put it, "there is so much to do, and so little has been done"—he is now at work on 16 different projects. The state's 1,300 miles of general shoreline, including 800 miles of sandy beaches, provide a big workshop, holding problems that are duplicated in other parts of the country.

Per Bruun

• **Man-made problems**—The problems Florida's beach erosion expert faces are many and important—for disappearing sandy beaches could, in time, mean dwindling of the millions who flock to that vacation state winter and summer. And the beaches are suffering not only from natural causes but also man-made erosion, according to Per Bruun.

For example, he notes that developing Florida's harbors by deepening inlets and protecting them with jetties does the job but "advantages in navigation have been gained at the cost of very serious erosion problems on the downdrift side of the inlets."

Per Bruun is also severely critical of protection works "conceived in desperation and built with insufficient knowledge of the complicated engineering problems involved, even when such knowledge could be obtained." He adds, "Types of construction that have been given up elsewhere have been built in Florida recently." These man-made beach destroyers are the result of the fact that "coastal protection in Florida, heretofore, has been almost entirely in the hands of individuals."

Computer Consulting Firm Will Set Up, Process Data

The first of what is expected to be a new breed of consulting firms has been formed in Fort Worth, Tex.

Known as Datics Corp., the new consulting firm offers an integrated electronic computer data processing service —from setting up of problems to production of data in the computers.

The company is already performing analyses of a number of water distribution networks using the Hardy Cross analysis on an electronic digital computer.

Only a minimum of experience has been gained using the digital computer for such analysis, but benefits are expected to be in the same order of magnitude as is being obtained with the electric fluid network analyzer by the cities of Baltimore and Philadelphia.

Datics Corp. also has computer programs for a number of calculations pertaining to the highway engineering field (ENR Mar. 14, p. 22).

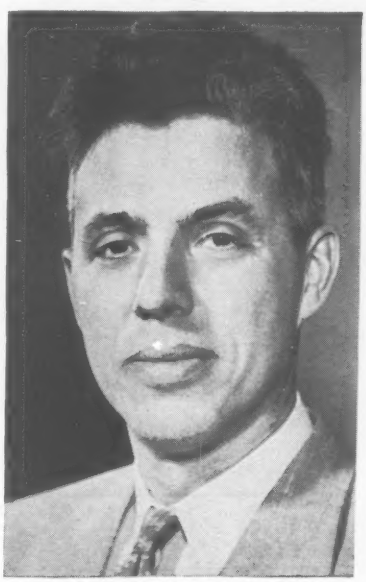
Land Clearance Group Names Executive Director

The appointment of Phil A. Doyle as the new executive director of the Chicago Land Clearance Commission, has been announced by J. Ross Humphreys, chairman of the commission.

Mr. Doyle, a specialist in housing and redevelopment work for the past 20 years, has been deputy executive director of the commission for the past three years.

He succeeds Ira J. Bach, who has been named Chicago's first commissioner of city planning.

(*M&J continued on page 104*)

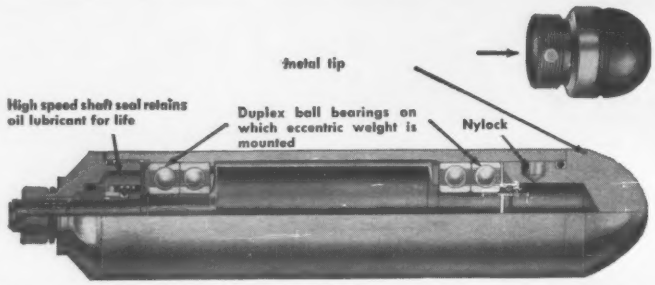


Phil A. Doyle

In Concrete Vibrators, it's the WALLOP that counts!

"Wallop", which is what many contractors call amplitude, is what it takes to vibrate a stiff mix — quickly and thoroughly. Recent tests prove that the efficiency of vibration increases in proportion to the amplitude. Therefore, Stow Manufacturing Co., Binghamton, N. Y., has developed a lightweight, rugged vibrator head that packs a *terrific* wallop.

Rugged new Stow 2 HP BU electric vibrator. It has Underwriter's Laboratories listing for 50/60 cycle AC operation.


Metal tip
High speed shaft seal retains oil lubricant for life
Duplex ball bearings on which eccentric weight is mounted
Nylock

Take a look at this vibrator head. It is 10 inches long, and available in diameters of 1⅝, 2 and 2½ inches, capable of 9000 VPM. Vibrations are achieved by use of an eccentric weight mounted in special high speed duplex ball bearings at each end. The outside of the head is case hardened, for extra long wear, and it has a replaceable tool steel tip. Stow estimates that these two improvements alone will double the life of the heads.

Big 5.6 HP Stow AG vibrator

Construction men report that they like the light weight, the long life, the low replacement cost, and the terrific wallop of these heads. Weight of the 1⅝" head is about 5 lbs.; the 2" head about 7½ lbs.; and the 2½" head, about 9 lbs. The cost of this head is less than ⅓ the cost of expensive "motor-built-in" type heads. The 1⅝" head is also available with a hard rubber tip for use where plywood forms are being used.

For more information about the complete line of STOW concrete electric and gasoline vibrators, vibrating screeds and rotary trowels, contact your STOW distributor by looking in the yellow section of your telephone directory under "Concrete Vibrators" or write for STOW Catalog 560.

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Business

D. E. Westervelt joins Kaiser Engineers, Oakland, Calif., as a principal engineer and assistant to T. A. Bedford, vice president of the development division. He leaves the post of special assistant to the Administrator, General Service Administration, Washington, D. C.

Hooper & Yolles, Consulting Engineers, Toronto, will now be known as M. S. Yolles & Associates. J. H. Hooper will go into private practice in Toronto.

Russell H. Fuller, Structural Engineer, of San Francisco, will be known as Fuller & Welisch, Structural Engineers.

Alfred L. Hartridge, vice president and treasurer of Stone & Webster Engineering Corp., has been elected a director of the corporation. Hartridge, who first joined Stone & Webster in 1931, is responsible for the executive direction and coordination of all activities in the Boston office.

Horace A. McAllister, Jr., and **Solon J. Dunetz** have formed a materials testing laboratory in Farmingdale, L. I.

Government

Robert B. Chessman, Astoria newspaper publisher and KAST radio station manager, is a new member of the three-man Oregon State Highway Commission. Mr. Chessman was appointed for a three year term by Gov. Robert Holmes to succeed Ben R. Chandler, Coos Bay, whose term expired Mar. 31.

York Brannock is named city utilities director at Burlington, N. C., succeeding **W. W. Adkins,** who resigns to accept a similar post at Greenville, N. C. Mr. Brannock formerly was superintendent of waterworks and construction at Augusta, Ga.

Associations

New officers of the Corrugated Metal Pipe Association of Chicago elected in a recent annual meeting, include: **F. M. Wilkins** of Omaha, president; **L. J. Busby,** Madison, Wis., and **W. B. Nern,** Wheeling, W. Va., vice presidents; **K. C. Thomas,** South Bend, secretary-treasurer.

Promoted by the Portland Cement Association are: **Martin A. Lewis,** to coordinator of interstate highway promotion; **Leo H. Corning,** to chief consulting structural engineer; **Homer A. Humphrey,** to senior highway consultant; **George H. Paris,** to director of promotion planning and engineering services; **Warren G. Burres,** to manager of the association's personnel training classes.

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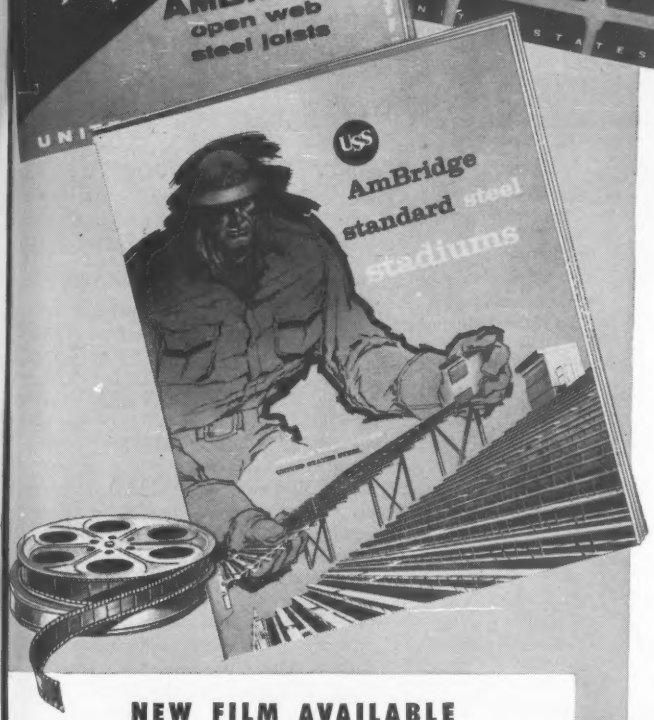

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USS AmBridge Open Web Steel Joists. Here's detailed information about the time-and-money-saving advantages of these lightweight and economical standard and longspan steel joists. It is the only joist catalog with complete design information for spans up to 120 feet.

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"The Cantilever Bridge" (16mm, 25 minutes), a colorful film of cantilever bridges in general and the new Tappan Zee Bridge in particular, has just been released. This interesting, educational and entertaining sound film is now available without charge to business, fraternal and civic organizations, churches, schools and colleges. Also available are "The Suspension Bridge" (16mm, 20 minutes showing time), and "Building for the Nations" (16mm, 35 minutes showing time). For bookings, write to:

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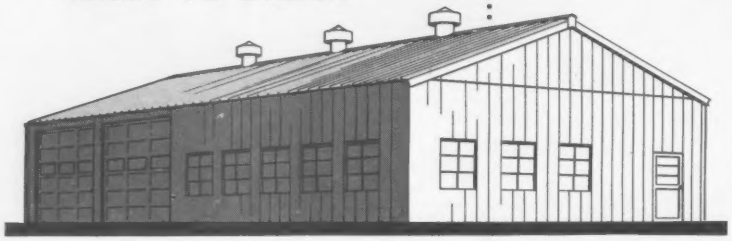

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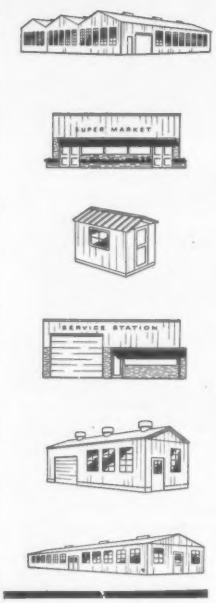

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Obituaries

Harry D. Churchill, 66, nationally known engineering consultant, author, professor at Case Institute of Technology, Cleveland, died Mar. 3. With Case for 36 years, he was professor of engineering mechanics and, more recently, chairman of the civil engineering department. The institute gave him a professional civil engineering degree in 1925. He was commander of the 112th Engineers in World War I.

William S. Kinne, 78, emeritus professor of civil engineering, University of Wisconsin, where he taught for 45 years before retiring in 1949, died Mar. 17 at Madison. Author of a number of engineering books and articles, his best-known work was as co-author of the six-volume Structural Engineers Handbook.

William C. Swalley, 55, president of F. D. Cummer & Son Co., Cleveland, died Feb. 8. He became president last June, after resigning as vice president of Wellman Engineering Co.

W. A. Sheets, 47, president of W. A. Sheets & Sons, Inc., Fort Wayne, Ind., construction firm, died recently.

James C. Moorman, 41, Oklahoma construction company executive, died Feb. 23 near El Reno, Okla. He was a partner in Moorman Construction Co., Muskogee, Okla.

Marshall Houghn, 56, veteran city water engineer at Columbus, Ohio, died in mid-March. He was an assistant superintendent under Water Superintendent Paul G. Laux, a post he held since 1950. He joined the city water department in 1931.

Elmer R. Coburn, 59, director of the planning and research division of the Connecticut Development Commission, died Mar. 18 in Newington, Conn. Mr. Coburn also was assistant managing director of the development commission. It was under his direction that the program of planning and zoning assistance to towns was initiated. He practiced architecture in the Hartford area and authored research and planning articles for national and professional publications.

Edward J. F. Boyle, 52, chief architect for the Federal Housing Administration in Connecticut, died Mar. 16 in Bloomfield, Conn. He was graduated from Yale Architectural School in 1937. He joined the FHA's regional office in Hartford in 1941 and was appointed chief architect in 1950.

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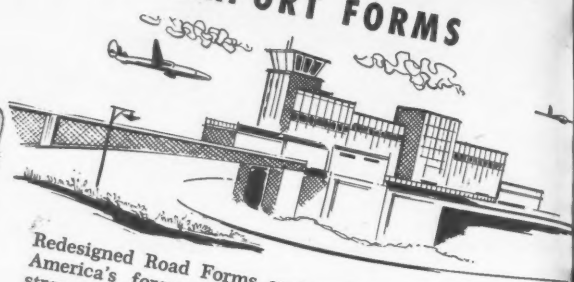

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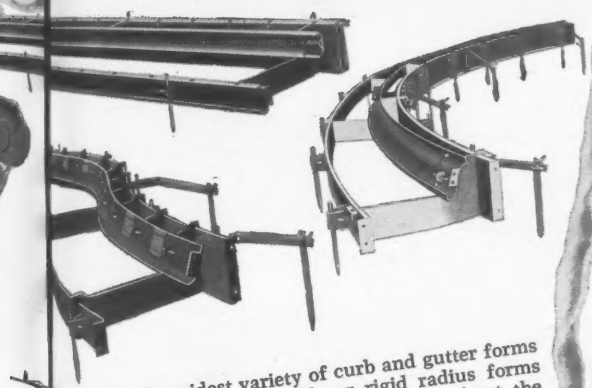
Heltzel's husky Dual Duty Forms have long been the favorites of contractors who build airport runways and ramps. These forms come in a number of double faces to enable contractors to pour two slab thicknesses with the same form.

e Form Value

CURB AND GUTTER FORMS



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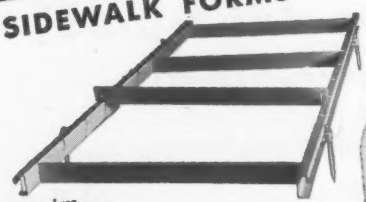
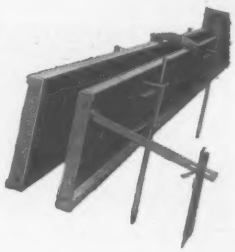
SIDEWALK FORMS

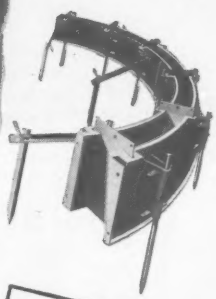


Here's an improved design sidewalk form with built-in Heltzel quality that assures lifetime performance. Division plate slots are spaced in one foot increments for better pouring practice.

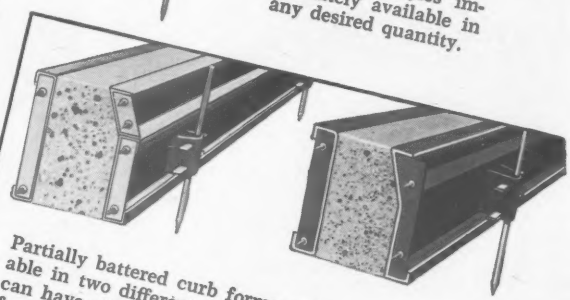
CURB FORMS

Heltzel Curb Forms now have full length stake pockets that add to form rigidity—make staking faster, more positive. Forms are made of prime steels



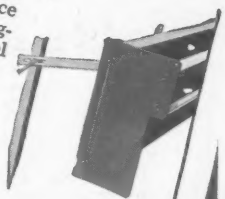


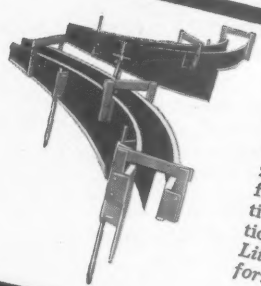
that have rerolled rail stakes. Battered or straight face in straight, fixed or flexible radius styles immediately available in any desired quantity.



Partially battered curb forms are available in two different types. Contractors can have either the single or two piece form. Both have the strength and ruggedness that is typical of Heltzel Steel Forms.

Adjacent forms for adding curbing to slabs already in are available in the widest variety of combinations.





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Whatsoever your forming needs it pays to specify Heltzel Forms. Heltzel will build forms to meet any specifications — for islands, foundations, driveways, piling, etc. *Literature available on all form types and styles.*

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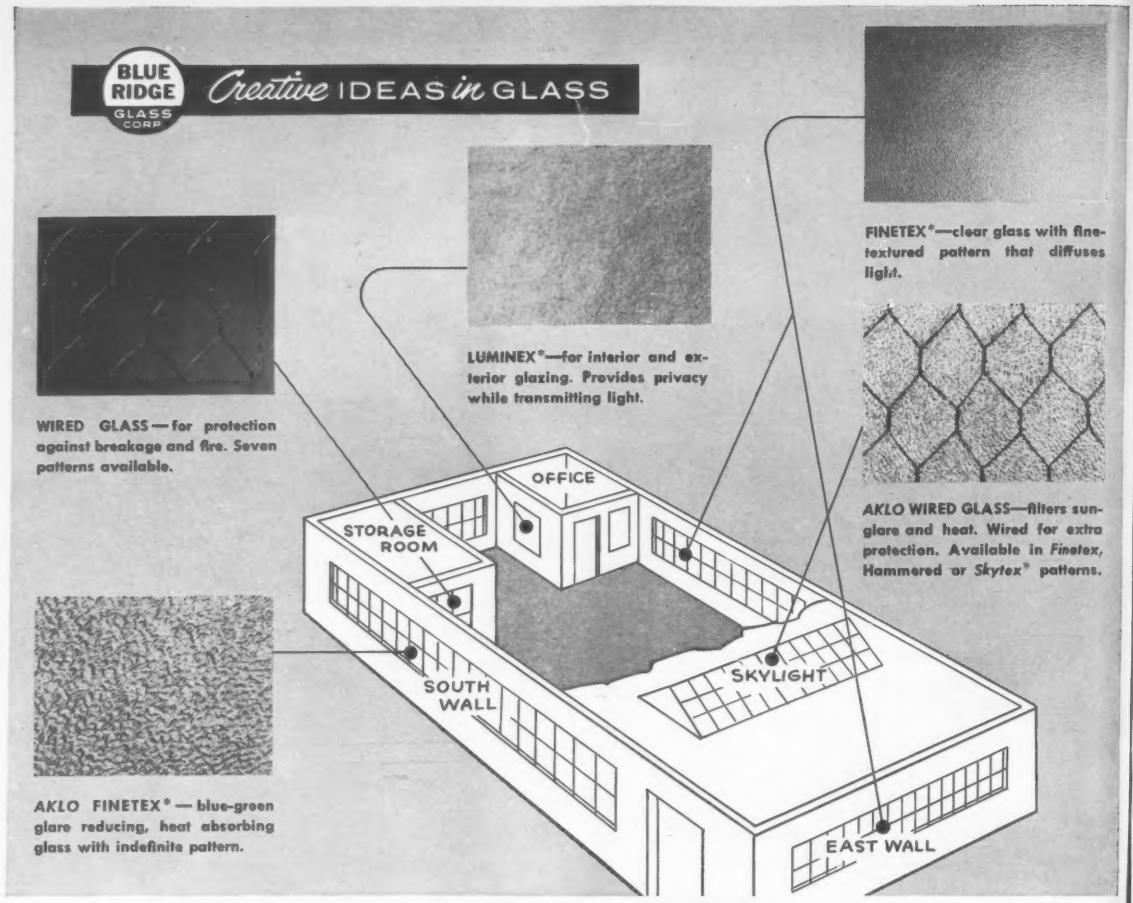
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Special Damages Allowed When Contract Rescinded

"It is well established that a party to an executed contract who discovers that material misrepresentations were made to him may either affirm the contract and sue for damages, or he may repudiate the contract and recover that from which he has parted. These remedies are said to be mutually exclusive, so that if a party chooses to rescind he cannot also recover damages for the fraud. However, it has been stated by this court, and others, that when a defrauded party rescinds the contract, he is entitled to recover damages 'incidental to the contract and caused directly by the fraud.' These damages have been referred to as 'special damages,' and are not to be confused with the damages recoverable when an election is made to affirm the contract."[1]

In the above case, a party contracted to purchase a house to be erected on land owned by the other party. The contract provided that if the house was not erected and ready for occupancy within one year, the buyer would have the right to rescind the contract and recover his deposit of $500. A year after the contract was executed and before the house was completed, the buyer of the house learned that the state of Virginia was considering the construction of a four-lane highway which would pass directly in front of the property he had contracted to purchase. Feeling that such a highway would make the house undesirable as a home for himself and his family, he notified the seller that he was exercising his right to rescind the contract because of failure of completion of the house within the one-year period as specified, whereupon the seller returned the $500 deposit.

At the time the contract was entered into, the agent of the seller told the purchaser that the vacant land in front of the lot on which his house was to be built would be developed into a park or divided into lots upon which residences would be built. After the buyer had rescinded the contract, he learned that the seller knew that the state was going to build a highway in front of the property he was buying and thereafter brought an action to recover the sum of $416.50, representing money he had paid to subcontractors for certain additions and improvements in the house being built which were not called for by the original plans. He was granted a recovery.

The judgment was affirmed by the appellate court,[1] which said: "The special damages recoverable upon rescission are given to compensate the defrauded party for those expenditures made in reliance upon the misrepresentation. Perhaps it is unfortunate that this compensation is referred to as damages, for actually it is a part of the restitution which is required in order that the parties might be placed in status quo ante. The rule, therefore, permitting recovery of special damages upon rescission is not in conflict with the general principle that rescission and damages are mutually exclusive."[1]

(1) Kent Homes, Inc. v. Frankel, 128 A. 2d 444, Municipal Court of Appeals for the District of Columbia, Jan. 14, 1957.

State License Not Needed For Government Contract

The U. S. Supreme Court has ruled that state laws requiring the licensing of contractors cannot be applied to contractors bidding on government contracts.

In many states, persons or corporations are required to obtain a license to engage in the contracting business. Thus, in the state of Arkansas, a local statute requires a person who undertakes to perform a construction job that will cost $20,000 or more to obtain a license from the state Contractors Licensing Board. Failure to obtain such license before bidding for a job imposes a penalty.

Several contractors submitted bids for the performance of work on a government airport. The state brought an action against the contractors to recover a penalty imposed for violation of the statute. The Supreme Court of Arkansas allowed the state a recovery, the court holding[1] that the contractors were required to obtain state contractor's licenses from the state Contractors' Licensing Board when fulfilling government contracts in federal areas in Arkansas over which the government had not accepted jurisdiction.

The contractors appealed to the Supreme Court of the United States, and that court held[2] that the local statute did not apply since the local statute created a conflict between the test of the responsibility of the contractor as determined by the local statute and the rules adopted by Congress and the Department of Defense. "Subjecting a federal contractor to the Arkansas contractor license requirements would give the state licensing board a virtual power of review over the federal determination of 'responsibility' and would thus frustrate the expressed federal policy of selecting the lowest responsible bidder."

(1) Leslie Miller, Inc. et al v. State of Arkansas, 225 Ark. 285, 281 S. W. 2d 946.

(2) Leslie Miller, Inc. v. State of Arkansas, 77 S. Ct. 257, Dec. 17, 1956.

General Contractor Sued By a Sub's Materialman

A general release executed by a materialman in reliance on a general contractor's promise to guarantee payment of money owed by a subcontractor has been held in Delaware not to bar the right of the materialman to sue the general contractor for payment. The facts were these:

The general contractor of a housing development who also was the owner of the buildings to be erected entered into a contract with another contractor to perform part of the work. The performance of the work under the subcontract required use of cement blocks which were ordered from a materialman. As the work progressed, the subcontractor, on several occasions, defaulted in the payment for the blocks that had already been delivered to the job, whereupon, the materialman stopped further deliveries. The general contractor then contacted both the subcontractor and the materialman and an oral arrangement was made whereby the subcontractor would give the materialman post-dated checks for the material delivered and the general contractor guaranteed that the materialman would be paid for all blocks delivered for the performance of the work.

After the work was completed, the general contractor asked the subcontractor to get a general release from the materialman so that he would not file a mechanic's lien on the property. The materialman, in reliance on the promise of the general contractor that he would guarantee payment of all post-dated checks, executed the general release.

The subcontractor delivered the release to the general contractor and asked him for a check for $13,000, which was the amount owing the materialman and the amount of the post-dated checks. The general contractor refused to give the subcontractor a check for $13,000, and was only willing to give a check for $6,600, which was the balance due the subcontractor. The subcontractor accepted the check, which was endorsed for deposit only. The

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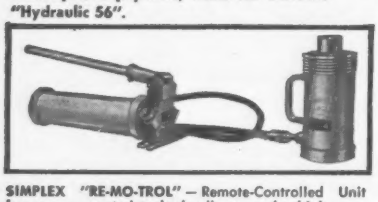
"Re-Mo-Trol" units are ideally suited for either job site or permanent prestressing bed use. Standard units are available from 10 to 100 ton capacities. They can be used directly on wires, rods or cables for high pressure tensioning, or for pushing or pulling against holding brackets in multiple bed stressing operations.

For detailed data on selection and application of Simplex equipment, write for Bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL" — Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. The "JENNY" is a self-contained center-hole hydraulic puller which also serves as a press or heavy duty jack. It is available in capacities from 30 to 100 tons.

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subcontractor crossed out the endorsement and cashed the check and stopped payment on all post-dated checks given the materialman.

The materialman then brought an action against both the general and subcontractor to recover the balance due and obtained a recovery which was affirmed on appeal. The general contractor interposed the defense that since the materialman had executed and delivered a general release, he had no cause of action. The court, however held, that since the materialman had delivered the release in reliance upon the representation by the owner that he would guarantee the payment of all post-dated checks and that the owner had not lived up to that promise, he was not bound by the release.[1]

(1) S & S Builders v. Di Mondi, 126 A. 2d 826, Supreme Court of Delaware, Nov. 9, 1956.

Promptness Is Required In Rescinding Contract

A contract induced by fraud may be rescinded. The right to rescind must be exercised promptly. A delay may mean loss of the right, as indicated by the circumstances in an Ohio case.

A party brought an action to recover the alleged balance on the purchase price of a heating supply business. The buyer counterclaimed, asking for a rescission of the contract on the ground that he had been induced to enter into it in reliance upon false representations made by the seller. The false representations were that the seller had franchise rights to sell certain products in Dayton, Ohio, where the business was located.

The contract in question was executed on Aug. 13, 1951, and the buyer took possession of the business on Aug. 16, 1951. Immediately after taking possession of the business, the buyer learned that the representations were false but made no complaint and continued to operate the business through the month of September, when he inserted an advertisement in the local paper for the sale of the business. The buyer did not express an intention to repudiate the contract until late in September, when the seller asked him to pay the balance due under the contract.

The court held[1] that, under the above circumstances, the buyer had waived any right it had to rescind the contract. "A waiver is generally defined as an intentional relinquishment of a known right, or such conduct as warrants an inference of relinquishment of such right." The court, held that, in view of the fact that the buyer continued to operate the business for a month after he learned of the fraudulent representations, he had waived his right to rescind the contract. The court stated: "A duty rested on the defendant (buyer) to act promptly upon discovery of the fraud. He cannot remain silent, continue to experiment with the business, and a month later assert his right to declare the contract void."

(1) Meyers v. Hoops, 140 N.E. 2d 65, Court of Appeals of Ohio, Dec. 14, 1955.

Substantial Performance In Building Contracts

While, ordinarily, one who agrees to perform work or do anything for an agreed compensation is not entitled to compensation unless he has fully performed all the terms and conditions of the contract, an exception is made in the case of construction contracts under which a contractor is entitled to recover where he has substantially performed the contract.

"The rule of substantial performance is especially applicable to building construction or improvement contracts of this sort, because the builder's material and labor cannot be returned to him. The courts are forced to weigh, on the one hand, the harm to be done to the owner if he is forced to accept and pay for a job that is not the job he contracted for; on the other hand, the injustice to the builder and the unjust enrichment of the owner if trivial deviations from the contract are to deny the former any pay whatever and to permit the latter to keep the fruits of the builder's efforts and material without compensation."[1]

(1) The S. D. & D. L. Cota Plastering Co. v. Moore, 77 N.W. 2d 475, Supreme Court of Iowa, June 19, 1956.

Acceptance of a Bid Constitutes Contract

A contract is formed when a bid is accepted. And a California court has ruled that once a contract for public works is awarded, the municipality cannot later change its mind and select another contractor.

In the California case, the low bidder was awarded the contract when the bids were opened. Later, the contract was awarded to the second lowest bidder and an action was instituted to determine who was to enforce the contract.

The trial court held that the municipality for whom the work was to be done had the right to award the contract to the second lowest bidder. This judg-

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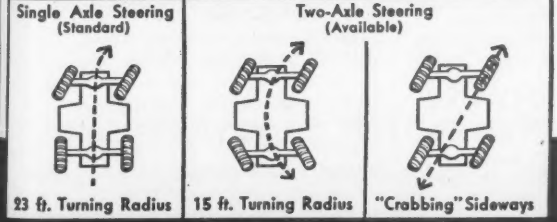

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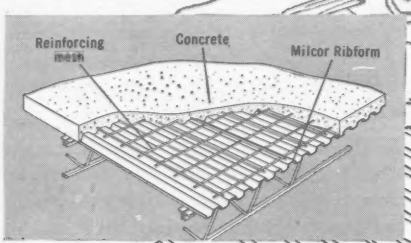

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ment, was however, reversed by the appellate court[1] which held: "It has long been decided in this and other states and in the courts of the United States that the letting of contracts for the doing of public works where the legislative body or the administrative officer is required by statute to call for bids and must under competitive bidding conditions let the contract to the lowest responsible bidder, the making of the award gives rise to a contract between the public body or agent and the successful bidder."

(1) Application of City of Susanville, 285 P. 2d 1007, District Court of Appeals of Cal., July 15, 1955.

Loss of Rent Recovered For Delayed Performance

Loss of rents may be included as an item of damages in the amount an owner may recover from a contractor for delayed performance.

In one case, for example, a building contractor sought to recover the balance due under a contract. The owner counterclaimed for the sum he had paid another contractor to complete the work, and, in addition, the loss of rentals resulting from delayed performance of the work. The owner obtained a judgment at the trial on his counterclaim and the judgment was affirmed on appeal.[1]

The case stemmed from a contract for construction of a building, which was to be completed and ready for occupancy by May 1, 1951. The contractor had knowledge of the fact that the owner had entered into a ten year lease of the building, said lease to start on May 1, 1951, the date of completion set forth in the contract. The construction contract contained no provision for liquidated damages for delayed performance nor any specific penalty for the failure to complete the building by May 1, 1951.

In April, 1951, certain changes were made in the specifications covering the interior painting work. In July, the architect informed the owner that the painting job did not comply with the specifications and the owner thereafter entered into an agreement with the contractor to repaint the defective part of the work and the owner agreed to pay the contractor the additional sum of $350. The owner also agreed to waive any claim for damages for delayed performance if the contractor completed the job and the same could be occupied by the tenant by July 13, 1951. The contractor did not complete the work by July 13, 1951, and the owner and tenant entered into an agree-

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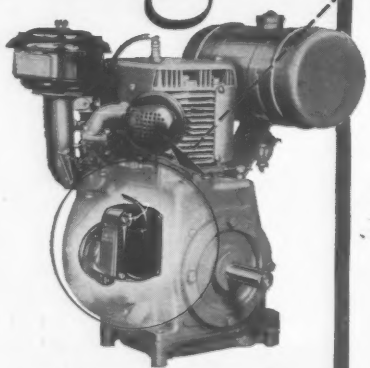

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ment whereby the tenant would take possession of the building on July 16, 1951, and would employ another contractor to complete the work and the owner would reimburse the tenant for the expense so incurred.

The counterclaim interposed by the owner was for the sum of $3,000 paid to the tenant as the cost of completing the work and for loss of rent from May 1, 1951, the date for completion set forth in the contract. The contractor claimed that the owner had waived his right to damages for delayed performance. The court held that the waiver was conditioned on the contractor completing the work by July 13, 1951, and as this condition had not been complied with, the owner did not waive the right to recover damages for delayed performance.

(1) Lidral v. Sixth and Battery Corp., 290 P. 2d 459.

Oral Evidence Allowed On Use of Trade Terms

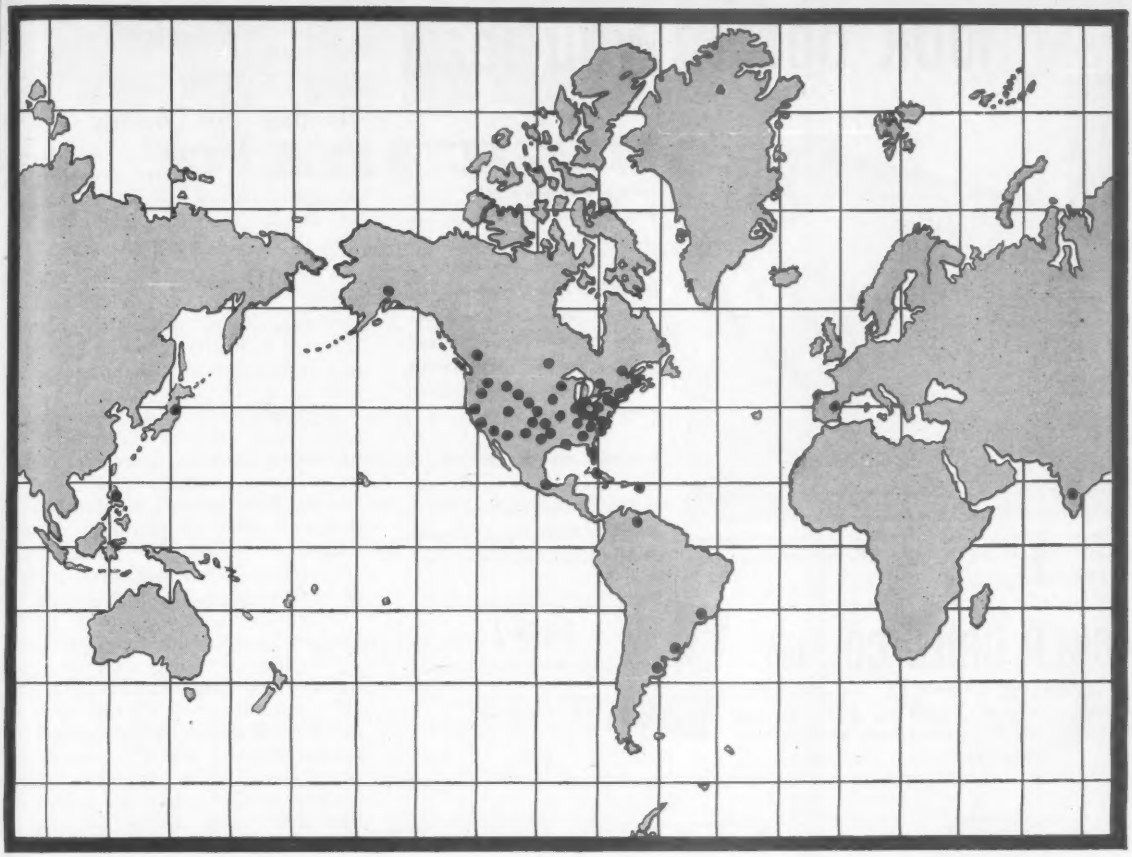
The general rule with reference to admissibility of evidence as to trade usage of certain terms is that while words in a contract are ordinarily to be construed according to their plain, ordinary and popular legal meaning, yet if in reference to the subject matter of the contract, particular expressions have by trade usage acquired a different meaning, and both parties to the contract are engaged in the same trade, the parties to the contract are deemed to have used them according to their different and peculiar sense as shown by such trade usage.

Parol evidence is admissible to establish the trade usage, and that is true even though the words are in their ordinary or legal meaning entirely unambiguous, inasmuch as by reason of the usage the words are used by the parties in a different sense.

"The basis of this rule is that to accomplish a purpose of paramount importance, namely, to ascertain the true intent of the parties, it may well be said that the usage evidence does not alter the contract of the parties, but on the contrary gives the effect to the words there used as intended by the parties. The usage becomes a part of the contract in aid of its correct interpretation."[1]

(1) Associated Lathing & Plaster Co. v. Louis C. Dunn, Inc., 286 P. 2d 825, and numerous cases there cited.

These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.



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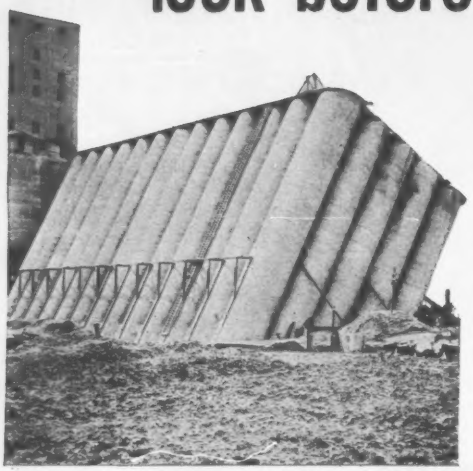

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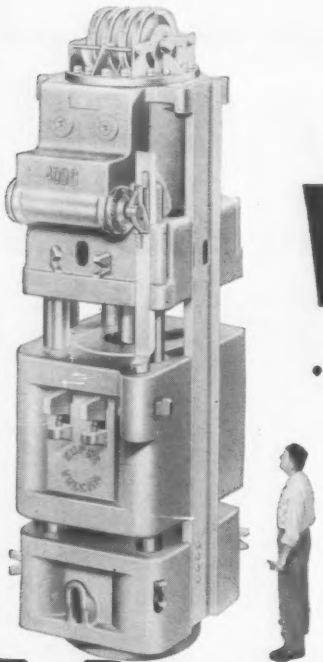

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Books

Heating and Cooling

HEATING VENTILATING AND AIR CONDITIONING GUIDE 1957, 35th edition—by the American Society of Heating and Air-Conditioning Engineers. 62 Worth St., New York 13, N. Y. 1,250 pp. ($12.)

The 1957 Guide, retaining the appearance, format and arrangement of previous editions, includes an enlarged technical data section and an expanded catalog data section, including reference material of 337 manufacturers.

Two chapters have been completely revised and rewritten. Chapter 9 on heat-transmission coefficients of building materials contains a new set of U-value tables covering many more constructions than in previous editions. Chapter 44 on control of the industrial environment is new and covers control of exposure of workers to heat.

The reference book consists of 51 chapters grouped into seven sections: (1) Fundamentals; (2) Human Reactions; (3) Heating and Cooling Loads; (4) Combustion and Consumption of Fuels; (5) Systems and Equipment; (6) Special Systems, and (7) Instruments and Codes. The 24 page subject index has been revised to facilitate finding information.

Miscellaneous Notes

• **Soils of New Jersey.** Results of nine years of research on the engineering characteristics of the soils of New Jersey are summarized in a 113 page volume, "Practical Applications of Engineering Soil Maps". The book explains how engineering soil maps can be used in laying out and designing highways, in community and airport planning, for subsurface investigations for foundations and for other engineering projects dealing with the soil. A county-by-county description provides engineers and contractors with a permanent record of soils they will find in a building or road project anywhere in New Jersey. The book is published by Rutgers University Press.

• **Fluid power diagrams**—A proposed standard on graphical symbols for fluid power diagrams is now in preparation. The American Society of Mechanical Engineers announces that free copies of the tentative draft may be had for criticism and comment. Write to Frank Philippbar, Standards Dept., The American Society of Mechanical Engineers, 29 W. 39 St., New York 18, N. Y.

(*Books continued on p.* 121)

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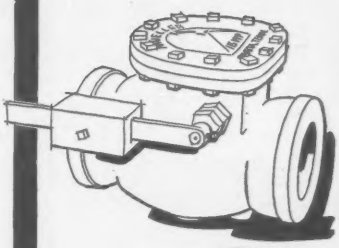
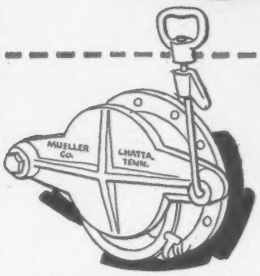
plant valves

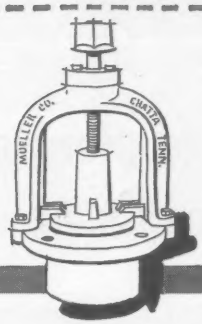
Check Valves For vertical or horizontal position, iron-body, fully bronze-mounted. Hub, flanged or screwed ends. Bronze seat ring with bronze or rubber disc ring. Swing-type; swing-type with lever and weight; or swing-type with lever and spring. 175 p.s.i. working pressure on valves through 12", 150 p.s.i. working pressure on valves 14" through 20". All sizes have 300 p.s.i. test pressure. Underwriters Laboratories and Associated Factory Mutual Laboratories approved also available.

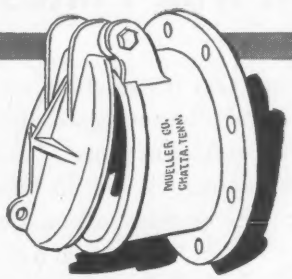


Shear Gates Iron body, bronze seat ring and disc ring. Flanged, hub or spigot frame. Sizes from 4" through 24". Furnished with 2' lift handle and catch. Gate latches 30° below horizontal. This design permits full opening of gate – no obstruction of orifice.



Mud Valves Iron body, bronze disc ring, seat ring and stem. Flanged or spigot frame with non-rising stem – sizes 3" through 24". Flanged or spigot frame with rising stem – sizes 4" through 18". Available with 2" wrench nut, handwheel or extension stem.





Flap Valves
Iron body, bronze seat ring and disc ring. Flanged, hub or spigot frame. Sizes from 4" through 24".

Various types of handwheel and geared floor stands, extension stems, chain and sprocket wheels, stem guides and indicator posts are available for any type of installation.

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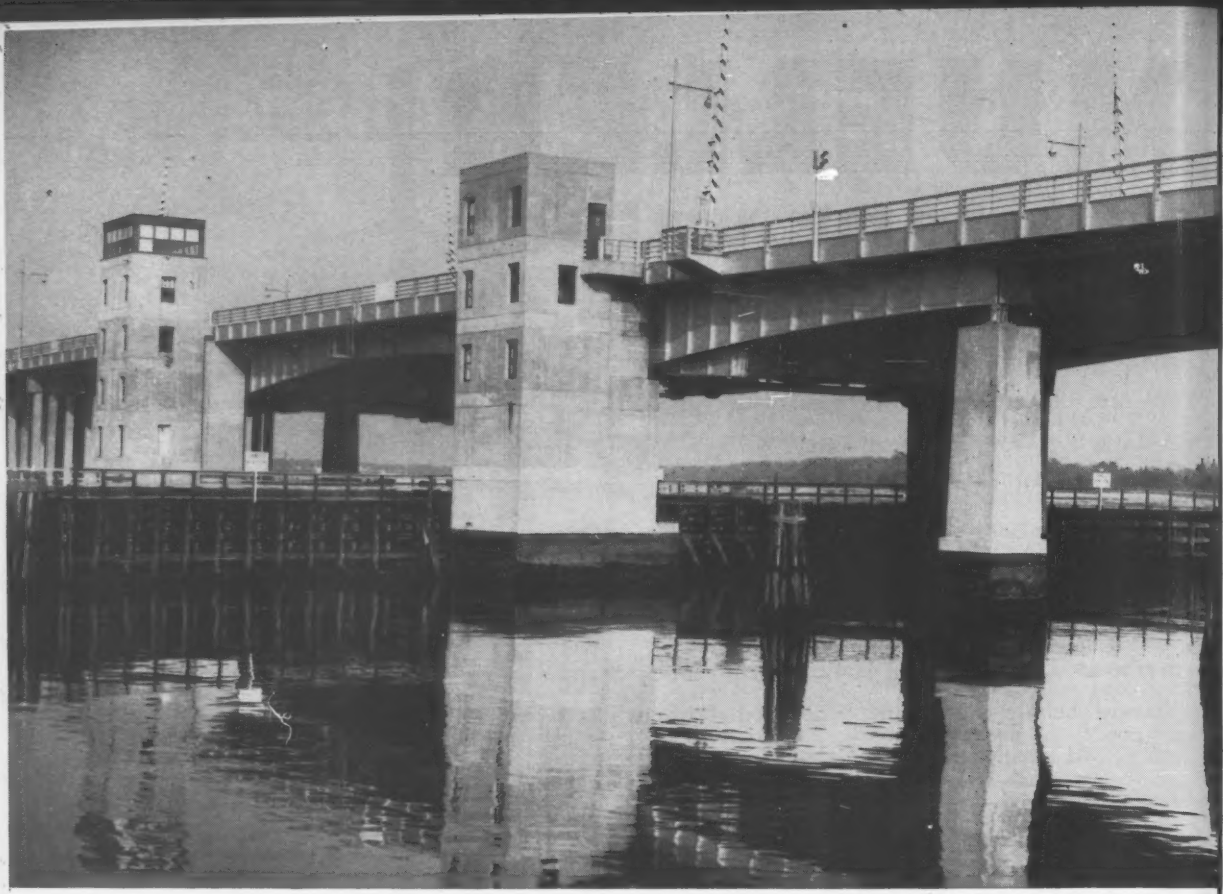
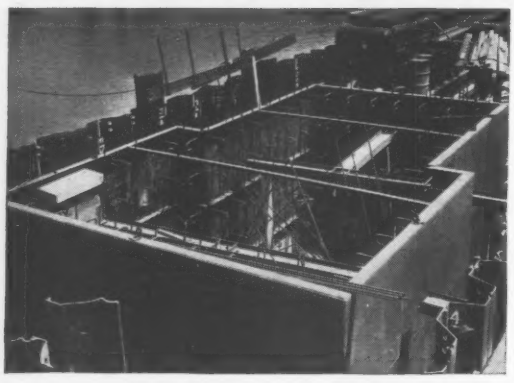


Protective scale which normally forms on the surface of wrought iron plates provides a long life additive for concrete substructures.

Bridge piers get low-cost protection against corrosion and spalling with Wrought Iron Plates



On new installations, wrought iron plates can serve in the place of forms for the concrete during construction.

Wrought iron pier protection plates stand up successfully to submerged and alternating wet-dry corrosion for extremely long periods of time.

The cost of such encasement is low in terms of protection for the concrete or other exposed structures. That's because wrought iron is such a reliable buffer against abrading or cutting action of water, floating objects and freezing and thawing.

We'd like to tell you more about wrought iron's saving in this service. Our booklet, *Wrought Iron for Bridge Construction*, contains illustrated case histories. Write for a copy. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

Available in Canada and throughout the world

BYERS Wrought Iron Tubular and Hot Rolled Products

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. . . Books

• **Marine borers**—Five parts of a continuing research project to find means of protecting exposed wood against attack by marine borers have been released through the Office of Technical Services, U. S. Department of Commerce. The five-year-old project, entitled Marine Borer Control, is being conducted at the Naval Research Laboratory. The five parts, 1, 4, 5, 6 and 7, deal with investigation of creosote as protection of wooden marine structures against borers; price is 50 cents each.

• **Oily substances and water**—A 72 page report is a survey and evaluation of the printed literature and other current knowledge relative to oily substances in water and their effects on the beneficial uses of receiving water. The report deals with statutes, sources, characteristics, some properties, effects and analytical methods. The study was made by Jack E. McKee, California Institute of Technology, for the California State Water Pollution Control Board. Copies of Publication 16 are available for $1.25 each from the State Printing Division, Documents Section, Sacramento 14, Calif.

Reports and Pamphlets

WEATHER ANALYSIS AND FORECASTING—Volume II—Weather and Weather Systems—by Sverre Petterssen. 266 pp. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $6.00.

NATIONAL FIRE CODES, 1956—Six Volumes. 174 separate standards, 4400 pp. National Fire Protection Association, 60 Bat-

NUMERICAL INTEGRATION OF DIFFERENTIAL EQUATIONS—108 pp. Dover Publications, Inc., 920 Broadway, New York 10. $1,35.

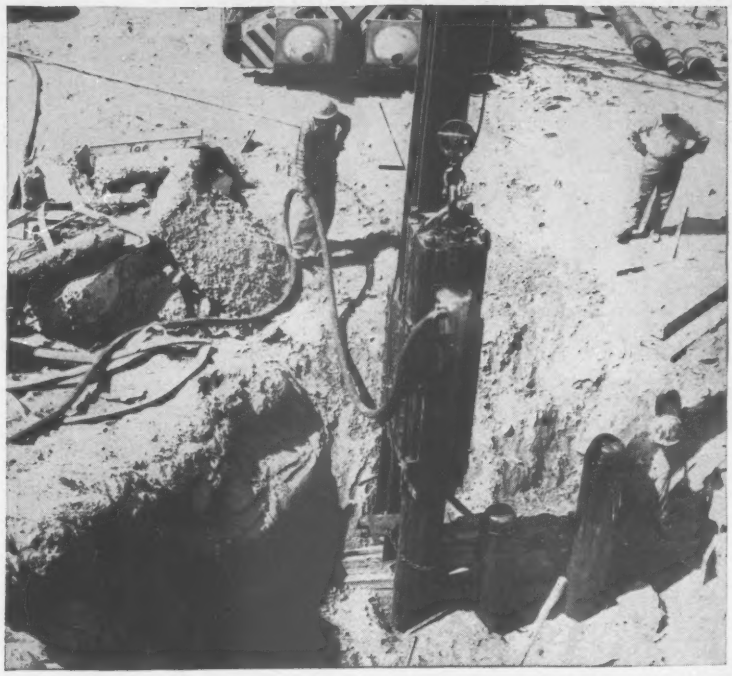
COMPOSITION AND PROPERTIES OF CONCRETE—by George Troxell and Harmer E. Davis. 434 pp. McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36. $7.75.

SCHOOL PLANNING AND BUILDING HANDBOOK—by N. L. Englehardt, N. L. Englehardt, Jr., and Stanton Leggett. 626 pp. F. W. Dodge Corp., 119 W. 40th St., New York 18. $12.75.

NATIONAL STANDARDS IN A MODERN ECONOMY—372 pp. American Standards Assoc., Dept. P-1, 70 E. 45th St., New York, N. Y. $5.00.

TEN-DIVISION INFLUENCE LINES FOR CONTINUOUUS BEAMS—by Georg Anger. 247 pp. Frederick Ungar Publishing Co., 105 E. 24th St., New York, N. Y. $9.50.

STRESS CORROSION CRACKING AND EMBRITTLEMENT—202 pp. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $7.50.



Double-Acting McKiernan-Terry Pile Hammer driving wooden piles with alignment maintained by means of an H-beam spud and grapples fastened to the sides of the hammer. This method of holding a pile hammer is facilitated by the all-enclosed McKiernan-Terry design. **McKiernan-Terry Corporation, 80A Richards Ave., Dover, N. J.**

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• Save man-hour costs • Reduce waste motion
• A complete work-station in one unit

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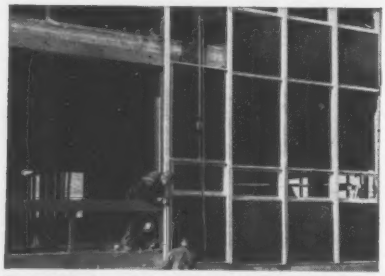
CONSTRUCTION IS FAST, SIMPLE:

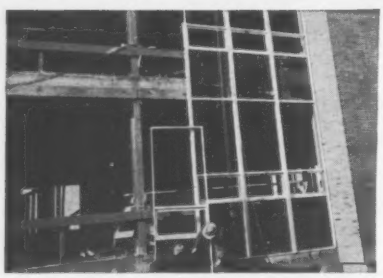
All-Season Installation: Experienced Lupton crew gets fast start even in freezing cold. Building is enclosed faster; interior finishing starts sooner.

Lupton crewmen accurately align and attach continuous aluminum sill at base of wall. Clips for anchoring mullions are factory pre-set and welded.

Lupton crewman bolts mullion to structural frame with heavy galvanized steel clips. Slotted holes permit accurate alignment.

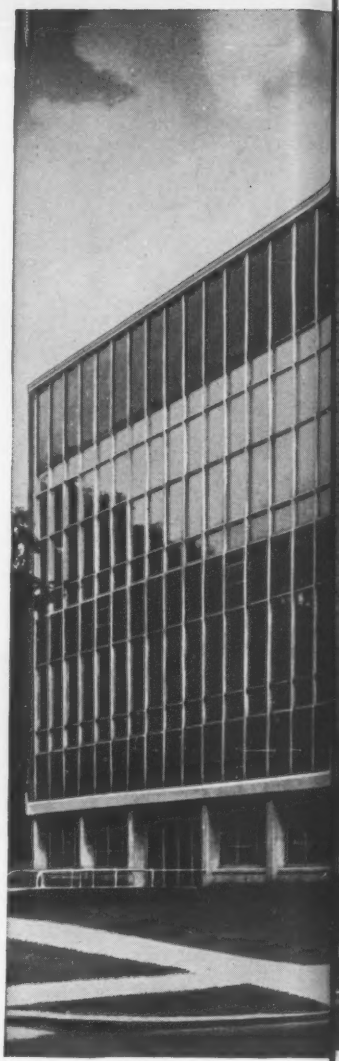


The vertical mullions that act as the "organizing element" of the wall are positioned with extreme accuracy, regardless of structural irregularities.



Here Lupton curtain wall units are positioned from outside building—convenient handling procedure for two- and three-story buildings.

Niagara County Building nears completion. Time and money saved in construction draw compound interest in minimum maintenance costs.



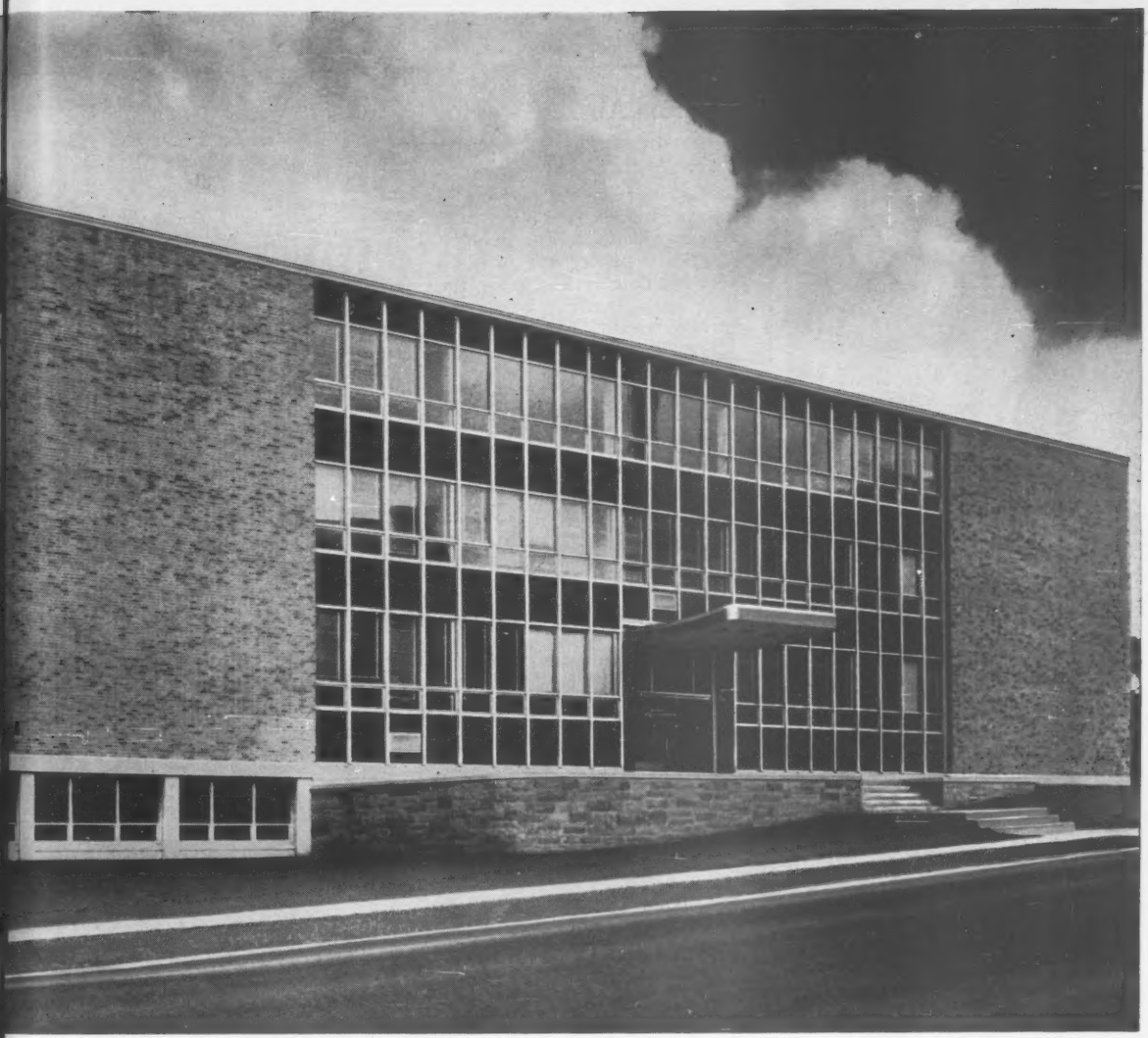
Lupton Aluminum Curtain Wall System:

LIGHTWEIGHT ALUMINUM WALLS

Builders can ignore the thermometer when they build with Lupton Aluminum Curtain Walls. There are no work stoppages, even in the coldest weather, when Lupton crews swing into action. The building is enclosed in a short period of time. The work of finishing interiors can begin without delay, in plenty of time to stay *on schedule* without costly overtime.

Single Contract—Single Responsibility: As sub-contractor for the completed curtain wall system, Lupton takes full responsibility for the manufacture, shipment and installation of Lupton Aluminum Curtain Walls. Other advantages: complete moisture protection, efficient insulation, balanced sandwich construction, replaceable panels, on-the-spot adjustments to compensate for irregularities in the building frame.

Important Installation Economies: The Lupton Curtain Wall System offers inherent savings in time and money. Maximum prefabrication of large-size wall units means least waste motion, minimum loss of time on the site. Lupton-trained crewmen are on the job, finished, out of the way of other construction in the shortest time possible. Installation can begin even before the building frame is finished. Wall components are light in weight, handle easily, go up in record time; greatly reduce



AGARA COUNTY BUILDING, NIAGARA FALLS, N. Y. Arch.: Charlec F. Obenhack. Contr.: Walter S. Johnson Building Co. Lupton Curtain-Wall System, Type G. Width module, 4'-0". Double glazing, 1" thick
d lights, ½" thick in ventilators. Ventilators open in. Opaque areas are double panel construction. Outside face is green-black porcelain enamel laminated with honeycomb core, galvanized back.
ide face is galvanized steel sheet covering 1" thick insulation. Back-up wall to sill height.

LS GO UP FASTER IN ANY WEATHER

ead weight load supported by structural frame. upton curtain walls—one-third as thick as conven- ional masonry—provide a *plus*-dividend in additional eful square feet on every floor.

easoned fieldmen that know their business, *plus* close ordination between factory and field add up to an *talled* curtain wall system with the accurate fitting d perfect alignment of wall components indispensable satisfactory curtain wall performance. Let Lupton gineers submit detailed recommendations based on eir study of the needs of your next job. Representatives e listed in the Yellow Pages under *Windows—Metal.* write or wire direct.

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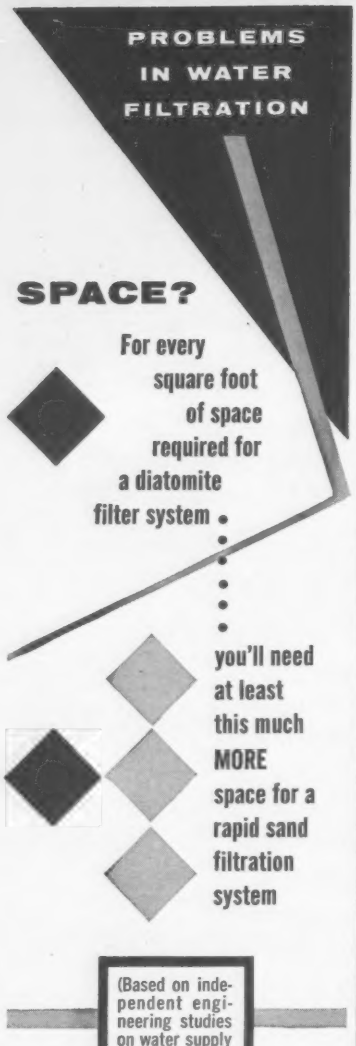

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Virginia Airbase Paving Complicated by Swamp

The 2,000 ft runway extension with taxiway, lighting and instrument landing system calls for embankment and pavement across a tidal swamp. This $1,905,570 project will make Langley Air Force Base serviceable for new types of military aircraft. Work must not interfere with military operation.

The Norfolk District of the Corps of Engineers took bids on four schedules.

At a price 7% below the engineers' estimate and 6.5% below the second low bid, the contract to Williams Paving Co., Inc., Norfolk, Va., was awarded on the schedule for two overruns and all concrete pavement on roads. The contractor was low also on the other three schedules. These included an alternate for flexible and concrete road pavement, priced 0.5% above contract price, and two schedules for one overrun with the same alternates for road pavement.

Concrete for the 10 in. and 11 in. airfield pavement must test at a flexural strength of 660 lb per sq in. in 90 days. For the 8 in. road pavement concrete must test at 600 lb in 28 days. Specifications require a cement content of 6.5 bags per cu yd of concrete.

Overruns are flexible pavement with a 6-in. dry-bound macadam base placed on a subbase of 6.5 in. and 5 in. selected material.

The Corps of Engineers furnishes aircraft arresting barriers to be erected by the contractor.

Minimum wage rates are $1.25 for laborers and truck drivers, $1.82 to $2.85 for equipment operators, $3.00 for steam fitters and $3.05 for electricians.

The three bidders are:

Schedule I (Contract Award in Combination with Schedule III)

Runway extension including overrun No. 7 Alternate for concrete pavement on roads A, B & C

1C Williams Paving Co., Inc., Norfolk, Va.	$1,808,864
2 George M. Brewster & Son, Inc., Bogota, New Jersey	1,932,506
3 Boyle Construction Co., Sumpter, S.C.	1,983,241
EE Corps of Engineers, Norfolk District, Va.	1,958,538

Bids: 1-17-57 Items	Unit	Quantity	Unit Prices 1 C	2
Clear & grub	ls	job	$22,500	$83,000
Demol in clear & appr zones & trans areas	ls	job	4,000.00	100.00
Storm drains w/o ditches	ls	job	165,000	140,000
overexcavation	cy	8,000	1.00	2.10
borrow, sand	cy	8,000	3.25	2.65
Exist water main, 12"&14", lower	ls	job	2,000	2,000
Dewater	ls	job	31,000	50,000
Mucking	cy	105,000	1.45	1.60
additional	cy	26,000	1.20	1.60
Excavation *	cy	142,000	0.77	0.60
Borrow, sand	cy	31,000	2.75	2.60
Borrow, sand additional	cy	10,000	2.70	2.60
earth *	cy	244,000	1.15	1.30
additional *	cy	58,000	0.90	1.30
Pvmt, airf, conc, 10"	sy	16,667	5.80	6.00
11"	sy	48,020	6.15	6.50
Overrun No. 7 & blast pvmt, flexible:				
subbase, sel matl, 6½"	sy	14,350	0.80	1.15
5"	sy	2,420	1.00	1.05
base crse, dry bound macadam, 6"	sy	19,490	3.00	2.65
prime coat	gal	7,000	0.17	0.22
bit matl for plant-mix	gal	7,400	0.17	0.22
bit mixt, plant-mix	t	515	10.85	7.85
bit mats for dbl bit surf treatment	gal	9,200	0.22	0.22
stone for dbl bit surf treatment	t	425	6.50	6.25
Pvmt, road, conc, 8" *	sy	22,100	5.00	5.50
Building, traffic check	ls	job	9,000	6,500
Curb, Conc	lf	332	3.00	3.00
Topsoil, 4"	cy	37,400	1.05	1.00
Seed & mulch	ac	73	245.00	245.00
Marking, airf pvmt, new	sf	49,720	0.07	0.06
remov	sf	24,770	0.05	0.04
Arrest barriers, compl	ls	job	28,000	25,500
Perim fence, exist, reloc	lf	3,920	1 80	1.80
new	lf	1,730	3 65	3.50
Airf light & teleph	ls	job	85,000	84,400
Instrument land syst	ls	job	25,500	19,000
Runway distance markers	ls	job	1,100 00	375.00

* Items eliminated under Schedule II

Schedule II

Runway extension incl overrun No. 7 Alternate for flexible pavement on roads A & B—concrete pavement on road C

1 Williams Paving Co., Inc.	$1,818,977
2 George M. Brewster & Son, Inc.	1,934,983
3 Boyle Construction Co.	1,975,504
EE Corps of Engineers, Norfolk District	1,943,384

Bids: 1-17-57 Items	Unit	Quantity	Unit Prices 1	2
Total Schedule I less items marked *		$1,256,224	$1,333,156	
Excavation	cy	144,000	0.77	0.66
Borrow, earth	cy	242,000	1.15	1.30
additional	cy	56,000	0.90	1.30
Pvmt rd C, conc, 8"	sy	2,675	6.50	6.50
Pvmt, rd A & B, flex, 15"				
subbase, sel matl, 7"	sy	21,100	0.85	1.20
base crse, dry bound macadam, 8"	sy	20,250	3.00	2.65
prime coat	gal	7,100	0.17	0.22
bit matl for plant-mix	gal	28,000	0.17	0.22
bit mixt, plant-mix	t	1,945	10.85	7.85

Schedule III (Contract Award)

Runway extension incl overruns No. 7 & No. 25 Alternate for concrete pavement on roads

1C Williams Paving Co., Inc.	$1,905,570
2 George M. Brewster & Son, Inc.	2,037,173
3 Boyle Construction Co.	2,061,285
EE Corps of Engineers, Norfolk District	2,048,450

Bids: 1-17-57 Items	Unit	Quantity	Unit Prices 1 C	2
Total Schedule I		$1,808,864	$1,932,506	
Excavation	cy	3,000	0.77	1.00
Borrow, earth	cy	11,600	1.40	2.30
Overrun No. 25 pvmt, flex				
subbase, sel matl, 6½"	sy	14,350	0.80	1.15
5"	sy	2,420	1.00	1.05
base crse, dry bound macadam, 6"	sy	16,790	3.00	2.65
bit matl for plant-mix	gal	3,600	0.17	0.22
prime coat	gal	6,000	0.17	0.22
bit mixt, plant-mix	t	250	10.85	7.85
bit matl for dbl bit surf treatment	gal	9,200	0.22	0.22
stone for dbl bit surf treatment	t	425	6.50	6.25
Topsoil	cy	1,600	2.25	1.00
Seed & mulch	ac	3	245.00	245.00
Marking, airf pvmt, new	sf	6,000	0.07	0.06

Schedule IV

Runway extension incl overruns No. 7 & 25 Alternate for flexible pavement on roads A & B—concrete pavement on road C

1 Williams Paving Co., Inc.	$1,915,683
2 George M. Brewster & Son, Inc.	2,039,650
3 Boyle Construction Co.	2,073,548
EE Corps of Engineers, Norfolk District	2,023,296

Time to complete: 360 calendar days
Liquidated damages: $200 per day

Deep in the Earth There's Another Reason Layne's on Top!

THE LAYNE IMPELLER is that reason, because a pump can be no better than its impeller.

There are two main considerations in impeller evaluation—QUALITY AND PERFORMANCE.

QUALITY—The materials used in the manufacture of a Layne impeller must be tough, durable and possess excellent *surface quality* and they must be able to insure *dimensional accuracy*. Metal patterns are used in casting high quality phosphor gear bronze into Layne impellers. Other special metals are specificed when necessary.

PERFORMANCE—A Layne impeller is correct in hydraulic design based on 75 years of Layne experience through thousands of successful installations and tests. Correct impeller design determines a pump's performance in any particular hydraulic condition.

Each Layne impeller is precision manufactured. Because no one technique is adequate, both hand finishing and special machining are used in balancing and tooling the impeller. Working to a rigid and minimum tolerance, specially designed gauges and instruments check each step to the finish of a Layne impeller . . . from water passages and angles to vane thickness.

Layne Impeller sizes range from 4" diameter and up, as specified.

The result — an impeller which operates deep in the recesses of the earth dynamically in balance. Each remaining component part of a Layne pump receives the same careful engineered attention, and when assembled assures complete pump perfection giving you years of trouble-free service.

Layne's 75 years of experience puts Layne on top!

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- Wage Rates, Building Board, Lath, Insulation: Last, Mar. 28; Next May 2.
- Cement, Aggregates, Ready-mixed Concrete, Asphalt: Last, April 4; Next May 9.
- Iron & Steel Products, Pine: Last, April 11; Next May 16.

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All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta † Baltimore * Birmingham † Boston ‡ Chicago ** Cincinnati * Cleveland ** Dallas k‡ Denver * Detroit ‡ Kansas City * Los Angeles 1 Minneapolis # Montreal ab New Orleans † New York 2 Philadelphia ‡ Pittsburgh 2 St. Louis # San Francisco A Seattle † Toronto a	**$83.00** **92.00** *97.50g* **87.00** *108.50* **101.00f** *99.00n* **93.00** *104.00* **96.00** *98.25* **94.00** **69.00** *Not in stock* **116.50** *125.00* **120.00** *120.00* *95.00* *140.00* **90.00** *180.00* **87.00** *110.00* **109.00** **130.00** **115.00** *80.00* *65.00* **96.00** *114.00*	**$88.00** **96.00** *105.00g* **89.00** *108.50* **101.00f** *99.00n* **96.00** *104.00* **97.25** *99.50* **95.00** **70.00** **119.50** *125.00* **123.00** *120.00* *95.00* *140.00* **100.00** *180.00* **87.00** *110.00* **110.00** *Range from $117.00 to $137.00* *Range from $131.00 to $163.00* **140.00** *140.00* **117.00** *125.00* *80.00* *73.00* **100.00** *120.00*	**$77.50** **96.00** *123.00g* **82.00** *105.00* **107.00f** *116.00* **90.00** *117.00* **87.00** *104.00* **99.00** *116.00* **85.00** *121.50* **114.00** *130.00* **120.00** *120.00* *95.00* *145.00* **90.00** *180.00* **91.00** *106.50* **119.00** *122.00* **130.00** *130.00* **125.00d** *132.00e* *83.00* *73.00* **95.00** *120.00*	**$76.00** **98.00** *123.00g* **89.00** *108.00* **107.00f** *116.00* **92.00** *118.00* **93.25** *106.00* **97.00** *108.00* **85.00** *121.50* **117.00** *130.00* **120.00** *125.00* *95.00* *145.00* **90.00** *180.00* **91.00** *120.00* **119.00** *122.00* **155.00** *155.00* **125.00d** *132.00e* *83.00* *73.00* **98.00** *122.00*	**$87.00** **98.00** *123.00g* **92.00** *108.00* **107.00f** *116.00* **97.00** *115.00* **98.00** *107.00* **97.00** *108.00* **85.00** *121.50* **117.00** *135.00* **120.00** *125.00* *95.00* *145.00* **108.00** *180.00* **90.00** *120.00* **129.00** *122.00* **140.00** *140.00* **125.00f** *132.00e* *83.00* *73.00* **100.00** *120.00*	**$95.00** **102.00** *123.00g* **97.00** *113.00* **117.00a** *121.00* **113.00** *116.00* **106.00** *110.50* **97.00** *108.00* **70.00** *126.00* **122.00** *135.00* **130.00** *130.00* *95.00* *145.00* **125.00** *180.00* **90.00** *120.00* **125.00** *124.00* **117/137** *131/163* **145.00** *145.00* **97.00** *120.00* **125.00** *130.00* **135.00** *136.00e* *83.00* *74.00* **100.00** *120.00*	**$150.00** **114.00** *133.00g* **112.00** *111.50* **109.00** *124.00* **119.50** *132.00* **97.00** *136.00* **135.00** *140.50* **127.00** *185.00* **130.00** *165.00* *119.00* *185.00* **108.00** *170.00* **97.00** *132.50* **125.00** *165.00* **117/137** *136/158* **145.00** *200.00* **130.00r** *192.00e* *115.00* *90.00* **100.00** *146.00*	*$144.00* *108.50* *139.00* *124.00* *132.00* *136.00* *147.50* *198.00* *210.00* *130.00* *185.00* **121.50** *132.50* *165.00* *165.00* *170.00* *132.50* *192.00* *123.00* *90.00* **140.00** *140.00*	*$144.00* *108.50* *139.00* *124.00* *132.00* *136.00* *152.50* *196.00* *210.00* *130.00* *185.00* **123.00** *170.00* **152.50** *165.00* *192.00* *150.00* *95.00* **140.00** *140.00*

LONG LEAF Y. P. Merchantable grade up to 20 ft.

2x12 Rgh	12x12 Rgh
$170.00	**$165.00**
115.00	**160.00**
136.00	**136.00**
141.75	**141.75**
130.00	**125.00**
250.00	**265.00**
214/224	**214/224**
155.00	
151.00	**151.00**

PLYWOOD Rail freight increment (See note for base price)

⅜"	¾"
$22.32	**$27.24**
25.92	31.60
21.78	26.58
25.92	31.60
22.45	27.37
25.00	30.48
25.37	30.93
18.72	22.80
13.92	16.98
25.00	30.48
16.56	20.16
16.61*ab*	*20.25ab*
19.89	24.25
18.72	22.80
25.92	31.60
25.92	31.60
18.72	22.80
12.22	14.91*a*

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. sad., truckload lots, $/6 Mfbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 8M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *f Hemlock *g No. 1 common. *j 8ft. lengths. *k No. 3 common. *n #3. A incl rail rate from North west mills to San Francisco are $11.80 to $18.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures.

PLYWOOD: Interior Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ⅜", $152.00; on ¼", $170.00. Exterior ⅜", $156.00, ¾", $174.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a Lower rate by water shipment. *b 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950*a*

	Single or Double Strength A quality	B quality
Atlanta	78%*c*	78%*e*
Baltimore	74%*d*	76%*d*
Birmingham	82%	83%
Boston	72–10%	72–10%
Chicago	72%	72%
Cincinnati	74%	74%
Cleveland	74–2–10%	74–2–10%
Dallas	75%	75%
Denver	73%	73%
Detroit	74–10–10%	74–10–10%
Kansas City	76–10%	76–10%
Los Angeles	70%	70%
Minneapolis	71–10%	71–10%
Montreal	40–10–5%*bc*	40–10–5%*b*
New Orleans	75%	76%
New York	79%	79%
Philadelphia	74–10%	76–10%
Pittsburgh	73%	73%
St. Louis	72–10–10%	72–10–10%
San Francisco	60%	72%
Seattle	67%	70%

EXPLOSIVES

Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*

Atlanta	$0.2540
Baltimore	.2540
Birmingham	.1990
Boston	.2540
Chicago	.2540
Cincinnati	2540
Cleveland	.2940
Dallas	.2615
Denver	.2590
Detroit	.2540
Kansas City	.2590
Los Angeles	.2565
Minneapolis	.2590
Montreal	22.05*h*
New Orleans	.2590
New York	.4425*g*
Philadelphia	.2540
Pittsburgh	.2540
St. Louis	.2590
San Francisco	.2540
Seattle	.2565

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Glass: *a Jobbers' list price per box, 14 x 20, as, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b Discount from list, Apr. 1951; sales tax included, but 8% tax exemption not allowable for. *c 77% for single strength *d Discount 6/18/52. *e 77% for double strength

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40%. Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E of the Miss., except Fla and Me...	$0.1990	$0.2340	$0.2540
W of Miss. to Rocky Mtn. States, Fla. and Maine	.2040	.2390	.2590
Rocky Mtn. States	.2040	.2390	.2590
Pacific N. W. States	.2015	.2365	.2565
Pacific S. W. States	.1990	.2340	.2540

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	**$0.51**	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.—3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.80/.88	....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.85	.92
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.83/.93	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak	....	4.00*a*	....	4.60*a*
New York	S. L. Sap Pine	2.00*d*	4.00*d*	3.00*g*	6.00*g*
	Mixed Oak	2.50*d*	4.50*d*	3.50*g*	6.50*g*
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.60/3.80	5.50/5.75
St. Louis	White Oak	2.65	....	2.95	....
	Red Oak	2.55	3.25*a*	2.80	3.60*a*
	Sap Pine or Cypress	....	3.15*a*	....	3.55*a*
San Francisco	Douglas Fir	2.03*ef*	2.96*ef*	2.84*bef*	4.31*caf*

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 7" x 9" x 8'. *c* Empty cell *d* 6 x 8 x 8'6" *e* Green. *f* f.o.b. cars. *g* 7 x 9 x 8'6" * Add 75¢/tie freight charge to Birmingham.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

BRIXMENT

Better Mortar for Blocks

BETTER BODY

When concrete block are laid, the mortar should have "body", to support the weight of the unit, thus holding it up to the line. If the mortar lacks body, the block will settle below the line even if a thick bed of mortar has been spread.

At the same time, plasticity is required. Unless the mortar is plastic, the bricklayer cannot quickly and accurately tap the block down to the line.

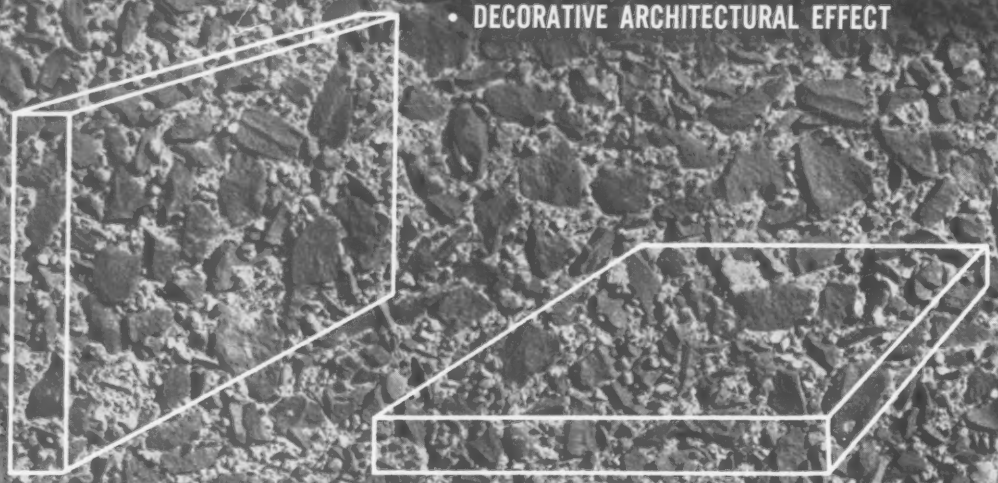
Brixment mortar has body and plasticity. It is firm but not stiff — soft but not sloppy. This combination of body and plasticity makes Brixment the best possible mortar to use with concrete blocks.

Louisville Cement Company . . . Louisville 2, Kentucky

EXPOSED CONCRETE AGGREGATE

for

- BONDING SURFACE AT CONSTRUCTION JOINTS
- DECORATIVE ARCHITECTURAL EFFECT



RUGASOL-F

RETARDANT FORM COATING

Rugasol-F is painted directly on formwork. When forms are stripped (2 to 5 days), the retarded surface mortar is removed with a jet of water or stiff brush.

(Rugasol-F was formerly designated Sika RFC #2 water-insoluble grade)

RUGASOL-C

RETARDANT CONCRETE COATING

Rugasol-C is applied on the surface of freshly placed concrete. On the following day, the retarded surface mortar is removed with a jet of water or stiff brush.

(Rugasol-C was formerly designated Sika RFC water-soluble grade)

You will find it easy to expose concrete aggregate with the Rugasol method. Rugasol eliminates the need for costly chipping, hacking, sand-blasting and acid washing on new construction work.

Write or call today for detailed information.

PLASTIMENT CONCRETE DENSIFIER—IGAS JOINT SEALER
RUGASOL (for exposed aggregate)—SIKACRETE ACCELERATING DENSIFIER

Sika®

SIKA CHEMICAL CORPORATION

PASSAIC, NEW JERSEY

DISTRICT OFFICES: BOSTON • CHICAGO • DALLAS • DETROIT • PHILADELPHIA • SALT LAKE CITY • WASHINGTON, D. C. • DEALERS IN PRINCIPAL CITIES—AFFILIATES AROUND THE WORLD

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Conn., Fairfield—BA 4/22—Town, Town Hall, sanitary sewers in area, Black Rock, Turnpike King's Hy. and Jennings Rd. $375,000. Bowe, Albertson & Assocs., 75 West St., New York, N. Y., engrs. No bids opened 3/18. CD 3/12.

Conn., Naugatuck—BA 4/22—Borough, Town Hall, 1,200 ft. 36 and 48 in. storm sewers, South Water St., pumps in 2 pumping stations and Bridge St., manholes, etc. Malcolm Pirnie, 25 W. 43 St., New York, N. Y., engrs. CD 4/3.

† **Conn., Hartford**—BA 4/23—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y., replacing hot water distr. sys. U. S. Naval & Marine Corps Reserve Training Center, NBy-8235, Spec. 8235/56.

† **Mass., Bedford**—SERVICE CLUB—BA 4/24—U. S. Eng., 150 Causeway St., Boston, service club, Lawrence G. Hanscom Air Field, ENG-19-016-57-198. $50,000-$100,000. Plans deposit $10, refundable. CD 8/23.

† **R. I., Davisville**—GUARD TOWER—BA 4/24—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston 10, Mass., erecting guard tower, Naval Construction Battalion Center, NBy-12774, Spec. 12774/56. Plans deposit $10. CD 9/12/52, under Public Buildings.

† **R. I., Davisville**—LIGHTING—BA 4/24—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston 10, Mass., replacing lighting Buildings 41 and 101, Naval Construction Battalion Center, NBy 12776, Spec. No. 12776/57. Plans deposit $10. CD 9/12/52, under Public Buildings.

† **Conn., New London**—LIGHTING SYSTEM—BA 4/25—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y. security lighting system, U. S. Navy Underwater Sound Laboratory, Fort Trumbull, NBy-8239, Spec. 8239/57. CD 1/25, under Public Buildings.

† **Me., Topsham**—STORAGE TANKS—BA 4/25—U. S. Eng., 150 Causeway St., Boston, fuel oil storage tanks, Air Force Station, ENG-19-016-57-199, $95,-000. Plans deposit $10, refundable.

† **Me., Limestone**—EXCAVATING, etc.—BA On Or About 4/30—U. S. Eng., 150 Causeway St., Boston 14, Mass., excavating and grading glide slope site, Loring Air Force Base, ENG-19-016-57-205. $50,000-$100,-000. CD 8/23.

† **Massachusetts**—BA On Or About 4/30—U. S. Eng., 150 Causeway St., Boston, Zone 14, repair of Crocker Lane, Cohasset, ENG-19-016-57-202. $15,000-$20,-000. CD 1/31, under LB.

† **Massachusetts**—STORM DRAINAGE—BA On Or About 4/30—U. S. Eng., 150 Causeway St., Boston, Zone 14, storm drainage Nike Battery 19, Control Area, Rehoboth, ENG-19-016-57-201. $25,000.

† **Vermont**—BA 5/1—U. S. Eng., 150 Causeway St., Boston, Mass., North Springfield Dam, excavation outlet works area and placing of excavated materials in rolled fill earth embankment, Black River, CIVENG-19-016-57-83. $300,000. Plans deposit $10.

† **Me., Bangor** — RAILROAD TRACKAGE — BA On Or About 5/2—U. S. Eng., 150 Causeway St., Boston 14, Mass., railroad trackage, Dow Air Force Base, ENG-19-016-57-52. $100,000-$150,000. CD 8/23.

† **Me., Bangor**—WAREHOUSE—BA On Or About 5/3—U. S. Eng., 150 Causeway St., Boston 14, Mass., base storage warehouse, Dow Air Force Base, ENG-19-016-57-196. $250,000-$350,000. Plans deposit $10. CD 8/23.

▲ **MASSACHUSETTS**—BA 5/7—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Boston—constr. section of J. F. Fitzgerald Expressway on rein.-con. viaduct from Dover St. to Union Park St. F.A. No. I-352 (2) Contr. N., $6,000,000; adv. ENR 4/18. CD 10/10, under Streets and Roads.

▲† **Rhode Island**—BA 5/28—U. S. Eng., 150 Causeway St., Boston, Mass., flood protection project, Blackstone River Basin and North Smithfield, incl. channel relocation and pumping station, Woonsocket, CIVENG-19-061-57-81. Over $5,000,000. Plans deposit $25.

▲† **Massachusetts**—BA 5/14—U. S. Eng., 150 Causeway St., Boston, flood control proj., 3 mi. south of Worcester, Blackstone River Basin, incl. constr. control dam, Auburn and Millbury, CIVENG-19-016-57-80. $4,000,000-$5,000,000. Plans deposit $25, refundable. Justin & Courtney, 121 S. Broad St., Phila., Pa., engrs. CD 4/5.

BUILDINGS—BA

Conn., Greenwich—SCHOOL—BA 4/22—Town, Glenville Elementary School addn. and modernization, $700,000, O'Hara Hedlander, Halasz & Edson, 45 E. Putnam Ave., archts., Frederick C. Wood, First Nat'l Bank Bldg., engr. CD 3/29.

Conn., Derby — HOUSING — BA 4/23 — Derby Housing Auth., Town Hall, Proj. MR-62, moderate rental housing, 50 units, 25 buildings. $650,000. Plans deposit $25. Bannon & Antinozzi, 2503 Main St., Stratford, archts. CD 10/17.

† **Mass., Reading**—VEHICLE STORAGE—BA 4/26—U S P and FO, 905 Commonwealth Ave., Boston, motor vehicle storage and service center, Camp Curtis Guild, $140,000. Plans deposit $25. Bradford & Weed, 145 Munroe St., Lynn, archts.

BUILDINGS—SLC

Mass., Shrewsbury—OFFICE—Oliver Assoc., c/o Doak Martin, archt., 8 Norwich St., Worcester, soon lets contract, office, salesroom, warehouse, Rte. 9. $100,-000.

Mass., Worcester—CHURCH—St. Christopher's Parish, c/o R. C. Diocese of Worcester, 1 Tuckerman St., soon lets contract church, 950 W. Boylston St. $350,000. Edward J. Shields Assoc., 1245 Hancock St., Quincy, archts. CD 3/28.

Vt., Brattleboro—MUTUAL AID—The Brattleboro Mutual Aid Assoc., Inc., 9 Harris Pl., soon lets contract mutual aid bldg. $500,000. Cedric Start & Donald Moeller, c/o Webber & Erickson, 56½ Merchants Row, Rutland, Vt., archts. CD 3/27.

HEAVY CONSTRUCTION—LB & CA

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Western Mass. Contracting Engineers, Inc., Summer St., Lee, Mass. LB **$107,858**, est. $119,099. hy. and bridge work, South St., Dalton. Bids Mar. 26. CD 3/13.
MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Old Colony Constr. Co. of Quincy, Vernon St., Quincy, Mass. LB **$848,448**, est. $988,376. hy. and bridge work Rte. 138 north to Canton St. Amvets Memorial Hy., U 344 (9), Randolph. Bids Apr. 2. CD 3/21.
New England Dredge & Dock Co., 60 S. Water St., New Haven, Conn. LB **$238,300**, est. $163,800. dredging two channel areas, Westport Harbor, Westport, MASSACHUSETTS. Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. Bids Apr. 2. CD 3/26.
Paine & LaCave Co., 1047 Waltham St., Lexington, Mass. LB **$99,000**. site imprvs., Proj. 200-8, Orient Heights Proj., Waldeman Ave., East Boston, BOSTON, MASS. Boston Housing Auth., 230 Congress St., Boston, Mass. Bids Apr. 3. CD 3/27.
CONNECTICUT—State Hy. Dpt., 165 Capitol Ave., Hartford,
Conn.—Leverty & Hurley Co., 260 Bostwick Ave., Bridgeport, Conn. LB **$144,685.** (3 bidders) resurf. 1,906 lin. ft. Housatonic River Bridge on Rte. 15 with Dense graded Milford and Stratford, Proj. 138-83, Fairfield and New Haven Counties.
Conn.—Oneglia & Gervasini, Inc., Casson Ave., Torrington, Conn. LB **$437,423.** (3 bidders) composite rolled beam bridge center bridge over Naugatuck River and approaches on Main St., Rte. 8, Torrington, Litchfield Co.;
Conn.—Della Bitta-Bassola, Inc., Werking St., Plantsville, Conn. LB **$180,285.** (8 bidders) 2 span welded plate girder bridge over Shepaug River to approaches on Rte. 47, Washington, Litchfield Co. Bids Apr. 1. CD 3/13.
▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford, Bids opened 3/13.
Conn.—F. D. Rich Co., Inc., 550 Summer St., Stanford, Conn. LB **$3,531,000.** (1 bidder) combined bid Connecticut Turnpike Projs. 319-07 and 321-07, service stations, lunch rooms, incl. site imprvs., etc. and related work, Branford and Madison; LB **$1,963,000** (4 bidders) constr. in Branford only;
Conn.—Associated Constr. Co., 1010 Wethersfield Ave., Hartford, Conn. LB **$1,484,000** (4 bidders) constr. in Madison only. CD 3/13.
▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford, Bids opened 4/1;
Conn.—White Oak Excavators, Inc., 61 E. Main St., Plainville, Conn. LB **$1,438,546** (2 bidders) concrete paving 5,549 lin. ft. Main St., Route 44, incl. two composite rolled beam bridges over Indian Meadow Brook and Mill Brook at Bridge St. and Case Ave. over Mad River, and concrete paving 1,186 lin. ft. Main St., Route 44, Winsted (town of Winchester), Projects 162-38 and 162-71.
Conn.—Costello Constr. & Eng. Corp., 15 Pomfret St., Hartford, Conn., LB **$78,826** (6 bidders), b. conc. resurf. 3,500 lin. ft. Route 44A, Proj. 77-91, Mansfield.
Conn.—C. W. Blakeslee & Sons, Inc., 58 Waverly St., New Haven, Conn., **$72,784** (7 bidders) b. conc. resurf. 8,738 lin. ft. Wilbur Cross Parkway, Proj. 106-50, Orange. CD 3/13.
Domenic Bracchi, 239 Main St., Stamford, Conn., LB **$83,950** (4 bidders), gasoline station addn., Merritt Parkway, Proj. CP-S-51, NEW CANAAN, CONN. State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn. CD 3/19.

BUILDINGS—LB & CA

Wright & Morrissey, Inc., 263 South Champlain St., Burlington, Vt., LB **$591,222**, Alt. 1 plus $1,700, Alt. 2 plus $7,700, 3 story wing REHABILITATION CENTER, incl. boiler and laundry bldg., BURLINGTON, VT. DeGoesbriand Memorial Hospital, c/o Carl O'Connell Dir. Hospital Services, 115 Colchester Ave., Burlington, Vt. Cleverdon, Varney & Pike, 120 Tremont St., Boston, Mass., structural engrs. CD 3/6.
▲ **Leeland Constr. Co., Inc.**, 8 Camelia Place, Lexington, Mass. Owner Builds. **$1,020,000.** RESIDENTIAL DEVELOPMENT, 68 units, BURLINGTON, MASS. Lester N. Lechter, 729 Boylston St., Boston, Mass., archt.
† **Veterans Admin.**, Munitions Bldg., Wash., D. C. cancelled bids to have been opened Apr. 2, GARAGE BLDG. No. 10 addn., Veterans Admin. Hospital, WEST ROXBURY, MASS. CD 2/12.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† **N. Y., Freeport**—RIFLE RANGE—BA 4/22—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York, Zone 7, small bore indoor rifle range, U. S. Naval and Marine Corps Reserve Training Center, NBy 8099, Spec. 8099/56.

† **N. Y., Scotia**—BA 4/22—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York, Zone 7, replace concrete curb and seal coat pavement, U. S. Naval Reserve Training Center, NBy 8271, Spec. 8271/57.

† **N. J., Earle**—DECK RESURFACING TRESTLES—BA 4/23—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y., deck resurf. Trestles Nos. 1 and 2, U. S. Naval Ammunition Depot, NBy 8106, Spec. 8106/56. Plans deposit $25. CD 8/28, under Public Buildings.

N. Y., New York—PARKING LOTS—BA 4/23—Office of the Chief Engineer of the Port of New York Authority, 111 Eighth Ave., New York, Zone 11, three parking lots between Dyer and Ninth Avenues and 37 and 39 Sts., Contr. LT-160.062. Plans deposit $30. CD 1/18/54, under New York-New Jersey.

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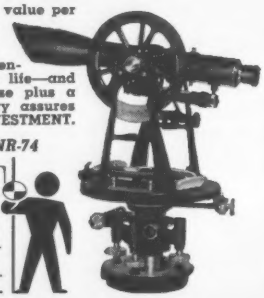

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† **Md., Carderock**—SPHERE—BA 4/24—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., 38 ft. diam. welded steel sphere on concrete foundation at David W. Taylor Model Basin, NBy 11430.

† **Md., Carderock**—VACUUM SPHERE—BA 4/24—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., vacuum sphere, David W. Taylor Model Basin, NBy 11430.

Md., Leonardtown—BA 4/24—Corporation Comrs., Leonardtown, sewage treatment plant, sewage lift station. Plans deposit $40, Johnson & Williams, 2107 K St. N.W., Wash., D. C., engrs.

D. C., Wash.—BA 4/26—D. C. Govt. Dpt. Sanitary Engineering, 499 Pa. Ave. N.W., sewage treatment plant addns., Secondary Treatment Plant Unit No. 23. Plans deposit $50.

N. Y., New York—CONTACT RAILS—BA 4/26—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, replacement of contact rails, Third Avenue Line, E. 148 St. to E. 216 St., Bronx Boro, Contr. T-125.

† **N. Y., Syracuse**—INFIRMARY—BA 5/7—U. S. Eng., 111 E. 16 St., New York, Zone 3, infirmary (FY 1956 program), at Syracuse Air Force Station, ENG-30-075-57-222, $125,000-$150,000. Plans deposit $10. CD 2/29/56.

N. Y., Syracuse—BA 4/24—Onondaga County Water Auth., Onondaga County Court House, pipe line in town of Camillus, consisting of approx. 6,500 lin. ft. pipe and appurtenances, alternate bids on 24 and 30 in. diam. prestressed concrete, c.i. and steel pipe, Alternate 1A; installing materials only, Alternate 1B; and furnishing, installing complete Alternate 2. Plans deposit $10, O'Brien & Gere, 400 E. Genesee St., Zone 2, engrs. CD 1/23/56.

N. Y., Brooklyn—PIPING, INSULATION, etc.—BA 5/24—New York City Transit Auth., 370 Jay St., Zone 1, furnishing, installing insulation for piping and equipment for Kent Avenue Power Plant, Contr. P-124.

Pa., Hellertown—BA 5/27—Hellertown Borough Auth., Boro Council Chambers, Boro Hall, 685 Main St., sewerage sys. Plans deposit $90. Leonard M. Fraivillig Co., 633 Main St., Bethlehem, engrs., adv. ENG 4/18.

Pa., Chester—FIELD HOUSE, etc—Bids Asked—Sun Oil Co Employees Athletic Assoc., Marcus Hook, field house, parking area, $675,000. CD 2/25.

BUILDINGS—BA

N. J., Eatontown—SCHOOL—BA 4/23—Bd. Educ., Margaret Vedder School addn. $360,000. Micklewright & Mountford, E. Stuyvesant Ave., Trenton; archts. CD 6/18.

▲ **N. Y., New York**—STUDENT CENTER—BA 5/1—New York University, 40 Washington Square S., Zone 3, furnishing, erecting structural steel for student center bldg., Proj. NY 30-CH-35 (S). Plans deposit $100. Harrison & Abramovotz, 630 Fifth Ave., New York, Zone 20, archts. CD 10/5/55.

N. Y., New York—QUARTERS—BA 5/1—Dpt. P. Wks., Municipal Bldg., Zone 7, general constr. work, plumbing, heating and ventilating, electrical work for quarters for Engine 11 and Ladder 11 at 222-224 E. Second St., Manhattan Boro. Plans deposit $25. CD 3/7/55.

N. Y., New York—BUILDING ALTERATIONS—BA 5/7—Office Chief Engineer of the Port of New York Authority 111 Eighth Ave., Zone 111, alterations to third and sixth floors of Port of Authority Bldg. 111 Eighth Ave., Contr. EXD-130.028. Plans deposit $30. CD 1/18/54.

Pa., Parkesburg—PLANT—BIDS Asked—Prospect Iron Works, 80 19 St., Brooklyn, N. Y., steel plant, railroad siding. $150,000. Francis A. McKeown, 2 Fox Lane, Flushing, N. Y., archt. CD 8/16.

BUILDINGS—SLC

▲ **Pa., Upper Darby**—SALES SERVICE, etc.—Sidney J. Goodstein, 6770 Market St., soon lets contract sales service and office. $1,000,000. Lewis J. Cowan, 1505 Pine St., Phila., archt. CD 3/19.

HEAVY CONSTRUCTION—LB & CA

† **A. S. Schulman Electric Co.**, 2416 S. Michigan St., Chicago, Ill. LB $379,497 (2 bidders) electrical system installation at Grasse River Lock, Massena, St. Lawrence Co., for St. Lawrence Seaway Development Corp., CIVENG-30-023-57-47, NEW YORK. U. S. Eng., foot of Bridge St., Buffalo 7, N. Y. Bids Mar. 27. CD 1/31.

Duropave, Inc., 210 Rogers Ave., Brooklyn 26, N. Y. LB $282,341 (4 bidders) roadway paving and incidental work on Kosciuszko Bridge over Newtown Creek between the Brooklyn and Queens Boros, NEW YORK. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Apr. 5. CD 3/11.

Macasphalt Constr. Corp., 3315 Lawrence St., Flushing, N. Y. LB $116,568. No. 4, asphalt paving Fillmore Ave.; No. 9, asph. repaving, Rutland Rd., Kingston Ave., Winthrop St., BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn 1, N. Y. Bids Apr. 2. CD 3/26;
B. Turecamo Contg. Co., Belt Parkway, foot of 24 Ave., Brooklyn, N. Y. LB $249,603. No. 1, grading E. 34 St.; No. 2, E. 93 St.; No. 3, E. 96 St.; No. 5, Hendrickson St.; No. 6, W 15 St.; No. 7, 27 Ave.; No. 8, Park Pl., Benson Ave., 19 Ave. (Brooklyn, N. Y.).

Columbia Asphalt Corp., 35-32 Lawrence St., Flushing, N. Y. LB $94,377. American Playground between Noble and Milton Sts. west of Franklin St., Contr.
(Continued on page 132)

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(Continued from page 130)

B-1-156, BROOKLYN, N. Y. Comr. Parks, Dpt. Parks, Arsenal bldg., Central Park, 64 St. and Fifth Ave., New York 21, N. Y. Bids Apr. 2. CD 3/26.

Patton Plumbing & Heating Co., 572 S. Park Ave., Buffalo, N. Y. LB $255,295. filtration and chlorination systems at 7 city swimming pools, BUFFALO, N. Y. City, Dpt. P. Wks., George J. Goetz, comr., City Hall, Buffalo, N. Y. CD 5/18.

Malter Constr. Corp., 1407 Bassett Ave., New York 61, N. Y. LB $392,285. playground adjacent to P. S. 192 between W. 136 and W. 138 Sts. west of Amsterdam Ave. Contr. M-223-156, NEW YORK, N. Y. Comr. Parks, Dpt. Parks, Arsenal Bldg., Central Park, 64 St. and Fifth Ave., New York 21, N. Y. Bids Apr. 3. CD 3/26.

F. L. Heughes & Co., 1029 Lyell St., Rochester, N. Y. CA $150,600. structural steel for Eastridge High School, IRONDEQUOIT, N. Y. East Irondequoit School Bd., Irondequoit, N. Y.

▲ **Delma Engineering Corp.**, 1208 Wyatt St., New York 60, N. Y. CA $1,867,705. constr. platform extensions to 79 and 86 St. stations of Broadway-Seventh Avenue Line, Manhattan Boro, Contr. C-119, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. CD 3/20, under LB.

Bonaco Constr. Co., Inc., 98 Park Place, New York 7, N. Y. LB $247,545 (5 bidders) supply and installation special double crossovers and incidental work north of 149 Street Station, Rte. No. 5, Jerome Ave. line Bronx Boro, Contr. T-126, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Apr. 5. CD 3/19.

Fago Bros. Constr. Co., 521 Young St., Tonawanda, N. Y. LB $369,120. Contr. 1, approx. 4,100 lin. ft. 24 in. gravity sewer, Brooklawn force main, SYRACUSE, N. Y. Bd. Supervs. Onondaga Co., Syracuse, N. Y. Bids Mar. 26; **Pepper Bros. Constr. Co.**, 200 E. Florence Ave., Syracuse, N. Y. LB $95,478. Contr. 2, pumping station (Syracuse, N. Y.).

Arthur R. Henry, Northfield, N. J. LB $77,354. boardwalk, landing platform, bulkhead, Proj. 520, Atlantic City, NEW JERSEY. State Dpt. Conservation & Economic Development, 137 E. State St., Trenton, N. J.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Malbros Contg. Co., 37-39 Highland Ave., Newark, N. J. CA $666,145. Rte. 208 bridges and approaches at Van Winkle Ave., N. Y. S. and W. R.R., Goffle Brook and Goffle Rd., Hawthorne Boro, Passaic Co. Bids Mar. 12, awarded Apr. 2. CD 3/20, under LB.

R. E. Disch, Inc., 31 Webster St., North Arlington, N. J. CA Est. $75,000. outdoor athletic field, RAMSEY, N. J. Don Boscoe High School, Franklin Turnpike, Ramsey, N. J. Joseph Novellino, Maple and Ackerman Aves., Glen Rock, N. J., archt.

NEW JERSEY—State Hy. Dpt., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,

Willis & Paul, Inc., Branchville, N. J. LB $372,987. (6 bidders) replace Rte. 23 bridge over Clove River, Sussex Co. Bids Apr. 2. CD 3/18.

▲ **NEW JERSEY**—State Hy. Dpt., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,

Public Constructors, Inc., P.O. Box 247, Gloucester, N. J. LB $1,630,830. (5 bidders) Rte. 42 North-South Freeway, etc., Camden and Gloucester Counties.

Stanley J. Zioboro, 158 Orchard St., East Rutherford, N. J. LB $176,246, est. $180,000. (4 bidders) golf course at Rockleigh, HACKENSACK, N. J. Bd. Freeholders Bergen Co., Administrative Bldg., Hackensack, N. J. Bids Apr. 2. CD 3/26.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

Pa.—**Latrobe Road Constr., Inc.**, P. O. Box 150, Latrobe, Pa. CA $2,843,071. r.-con. 3.79 mi. two I-beam bridges, hy. interchanges, three bridges, ramps, marginal roads and intersecting hys., from point in Allentown to a point north of Lanark, T.R.U.S. 309, Lehigh Co.; CA $981,259. divided hy., bit. surf. 3.89 mi., I-beam bridge, widening existing c. conc. from point 2.3 mi. south of Butler, southerly, T.R. 8, Butler Co.

Pa.—**F. A. Canuso & Sons, Inc.**, 173 W. Roosevelt Blvd., Phila. 20, Pa. CA $4,064,596. divided hy., 2.81 mi., two rein.-con. bridges, two rein.-con. arches, plate girder bridge, three plate girder bridges, three I-beam bridges, 1 bridge extension from near the Pennsylvania Turnpike south, part of Ambler by-pass, L.R. 782 (2), L.R. 197 (14) and L.R. 46112 (1), Montgomery Co.

Pa.—**James D. Morrissey, Inc.**, 9119 Frankford Ave., Phila. 14, Pa. CA $2,413,863. divided hy., 2.53 mi., five rein.-con. structures, two plate girder bridges, rein.-con. structure, plate girder and four I-beam bridges, intersecting hys. and approach ramps between Rose Valley and Sandy, T.R.U.S. 309, Montgomery Co. Grand total $10,302,789. CD 3/28, under LB.

William H. Gill, Lansdowne, Pa. LB $308,450. WW imprvs., 2 new booster pumping stations, PHOENIXVILLE, PA. Boro Council, Phoenixville, Pa. Bids Mar. 26. CD 3/18.

W. E. Caldwell Co., 200 E. Brandywine Ave., Louisville, Pa. LB $81,391. standpipe (Phoenixville, Pa.).

R. M. Luff Constr. Co., Willow Grove, Pa. LB $345,997. general constr. sewage treatment plant, service bldgs., tanks, WEST POINT, PA Upper Gwynedd Twp. Auth., West Point, Pa. Havens & Emerson, 233 Broadway, New York, N. Y., engrs.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Wright Contg. Co., Odenton, Md. CA $4,034,307. surf. dual hy. 3.23 mi. Hagerstown By-Pass and connecting roads, near Hagerstown, Contr. W-446-3-620, Washington Co. CD 1/31, under LB.

MARYLAND—State Roads Comn., 108 E. Lexington St., Baltimore, Zone 2,

C. H. Lawson, Inc., Williamsburg, Va. CA $554,518. surf. 4.02 mi. State Rte. 224, near Mason Springs, Contr. CH 297-2-520, Charles Co. CD 1/22, under LB.

W. F. Wilson & Son, Inc., Brookville, Md. LB $209,054. (7 bidders) Contr. 552 S, sewer interceptor, Gwynns Falls, TOWSON, MD. Executive Baltimore Co., County Office Bldg., Towson, Md. Bids Mar. 28. CD 3/18.

DELAWARE—State Hy. Dpt., Admin. Bldg., Dover, Bids opened 4/3,

John Julian Constr. Co., 109 S. duPont Rd., Elsmere, Del. LB $577,608. reconstructing Main St., Newark. CD 3/28.

BUILDINGS—LB & CA

▲ **William L. Crow Constr. Co.**, 101 Park Ave., New York 17, N. Y. CA Est. $2,000,000. SHOPPING CENTER to contain Lord & Taylor's store at White Plains Post Rd. and Wilmot Ave., EASTCHESTER, N. Y. Associated Day Goods Corp., 261 Madison Ave., New York, N. Y. Starrett & VanVleck, 267 Fifth Ave., New York 16, N. Y., archts.

▲ **Barr, Gleason & Barr, Inc.**, 501 Fifth Ave., New York 17, N. Y. CA Est. $2,000,000. 3 story OFFICE and STORE, Franklin Ave. and 10 Sts., GARDEN CITY, N. Y. Garden City Co., c/o Chapman, Evans & Delehanty, archts., 50 Broadway, New York 4, N. Y. Bids Mar. 1. CD 2/21.

Point of Woods Homes, c/o Lane Realty, 107-40 Queens Blvd., Forest Hills, N. Y. Owner Builds. $650,000. 27 HOUSES, Tanyard Lane east of West Neck Rd., HUNTINGTON, N. Y.

▲ **John W. Cowper Co.**, Sidway Bldg., Buffalo, N. Y. LB $1,994,000. (2 bidders) HIGH SCHOOL, LACKAWANNA, N. Y. Bd. Educ., Lackawanna, N. Y. Bids Mar. 28. CD 3/8.

▲ **John Lowry, Inc.**, 52 Vanderbilt Ave., New York 17, N. Y. CA Est. $3,500,000. OFFICE, 81-87 Maiden Lane, NEW YORK, N. Y. Northern Insurance Co. of N. Y., 81 Maiden Lane, New York 7, N. Y. CD 2/14.

▲ **A. Friederich & Sons**, 710 Lake St., Rochester, N. Y. LB $5,285,973 (3 bidders) general constr. East HIGH SCHOOL, ROCHESTER, N. Y. Bd. Educ., 13 S. Fitzhugh St., Rochester, N. Y. Bids Apr. 2. CD 3/5.

▲ **Oakdale Green Homes**, c/o Kern Realty Co., 124-26 Queens Blvd., Kew Gardens, N. Y. Owner Builds. $9,000,000. 700 HOUSES on tract on Jericho Turnpike, SMITHTOWN, N. Y.

Carpenter & Skaer, 120 Hardwood Pl., Buffalo, N. Y. LB $250,000. 14,000 sq. ft. WAREHOUSE, 50 Ensminger Rd., TONAWANDA, N. Y. Peninsular Steel Co., 1730 Kenmore Ave., Buffalo, N. Y.

George E. Williams, 137 Louisa St., Utica, N. Y. LB $627,600. reconstr. exterior of COURT HOUSE, UTICA, N. Y. Bd. Supervs. Oneida Co., Utica, N. Y. Walter Frank & Edmund C. Booth, Turnbull Heights, Utica, N. Y., archts.

Rathgeb-Walsh, Inc., Martin Place, Portchester, N. Y. CA Est. $450,000. SCHOOL for Our Lady of Sorrows Parish, WHITE PLAINS, N. Y. Archdiocesan Bldg. Comn., 451 Madison Ave., New York 22, N. Y. Bids Feb. 1. CD 1/17.

▲ **Robt. Lee Realty Co.**, 311 Oakdene Ave., Leonia, N. J. Owner Builds. $1,500,000. 1 story, 90,000 sq. ft. SHOPPING CENTER, incl. 25 stores, Kinderkermack Rd., EMERSON, N. J. Maurice Kraut, 22 Journal Square, Jersey City, N. J., archt.

▲ **Living Homes, Inc.**, 256 Westwood Ave., Fort Lee, N. J. Owner Builds. $2,250,000. 42 HOMES, Nostrand and Gloucester Sts., ENGLEWOOD, N. J. Harsen & Johns, Railroad and Summits Ave., Tenafly, N. J., archts.

Sellars & Stearns, Inc., 86 Glen Ridge Ave., Montclair, N. J. CA $494,294. (2 bidders) general constr. SCHOOL addn. and AUDITORIUM, Whippany-Florham Park, FLORHAM PARK, N. J. Bd. Educ., Hanover Park Regional School Dist., Florham Park, N. J. CD 5/16.

▲ **Frank Tozzali**, 520 Main St., East Orange, N. J. Owner Builds. $2,000,000. 55 HOUSES, Craig Rd., HILLSDALE, N. J. Rudolph Bolling, 40 Carol St., Ramsey, N. J., archt.

Ted & Irving Yungries, Aurora Hills Estates, Dover-Chester Rd., Ironia, N. J. Owner Builds. $700,000. 40 addnl. HOUSES on new subdivision added to and forming part of Aurora Hills Estates, Randolph Twp., IRONIA, N. J. Henry Vreeland, 4 Court St., Morristown, N. J., archt.

Thomas Alen Constr. Co., 79 Surrey Lane, Clifton, N. J. Owner Builds. $450,000. 22 HOMES, Eckel Rd. and Bertolott St., LITTLE FERRY, N. J.

Garden State Builders, Inc., 550 Pine St., Elizabeth, N. J. Owner Builds. $700,000. HOTEL or APARTMENT HOTEL on 4 lots on West End Plaza and Ocean Ave., LONG BRANCH, N. J.

▲ **J. M. Straus Co.**, Valley Rd. and Normal Ave., Upper Montclair, N. J. Owner Builds. $1,000,000. 40 HOUSES, Maple St. in Murray Hill Sect. of Twp., NEW PROVIDENCE, N. J.

(Continued on page 134)

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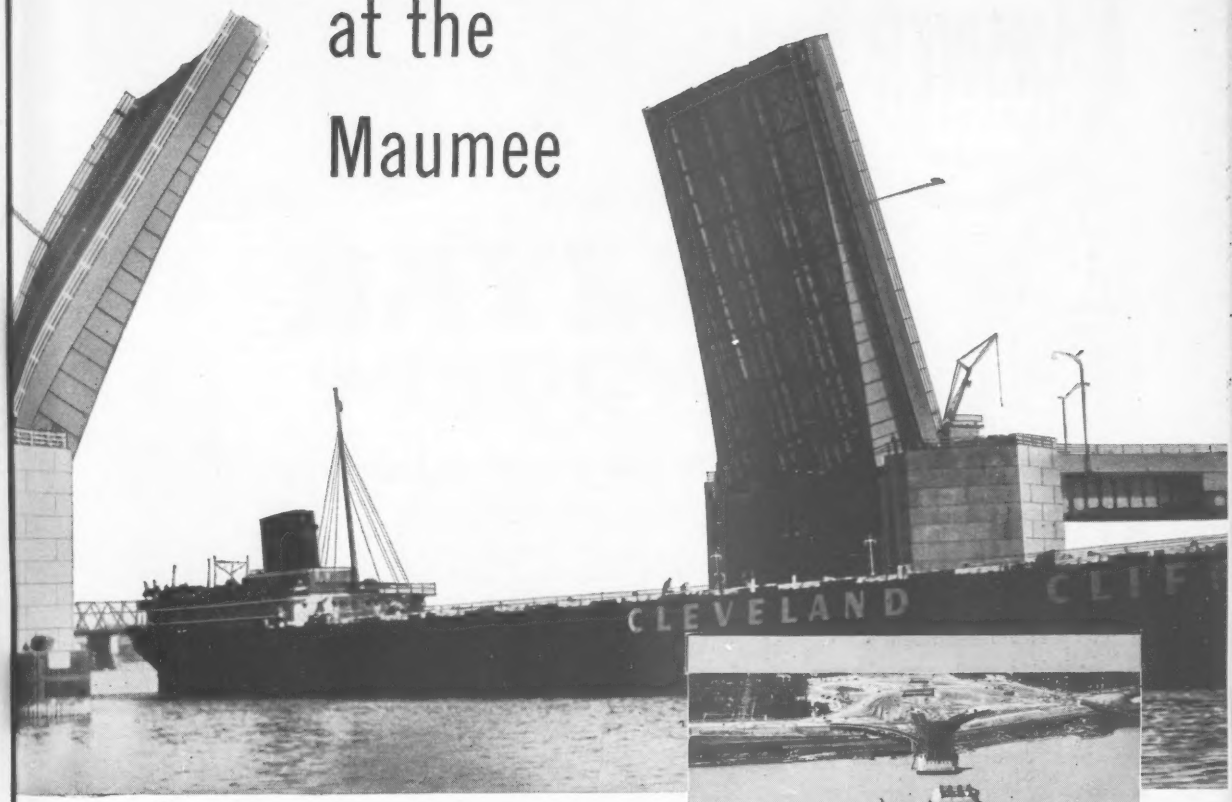

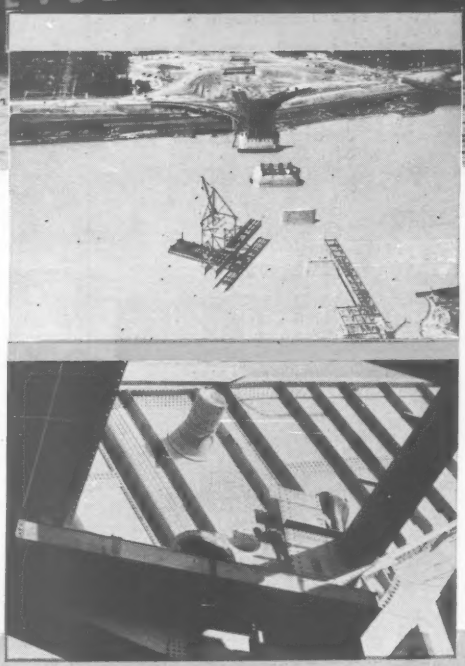

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Consulting Engineers:
Howard, Needles, Tammen & Bergendoff, Kansas City, Mo.

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- **ADJUSTABLE ARM**
  for vernier units from
  0.006 to 0.020 sq. in.

ZERO-SETTING LEVER

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or initial reading subtractions!

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Long Island City 1, N. Y.

(Continued from page 132)

Brookshire Land Development Co., 321 Summer Ave., Newark, N. J. Owner Builds. **$600,000.** 17 HOMES, Sunset Dr., NORTH CALDWELL, N. J. Davis & Farinella 29 Waldo Ave., Bloomfield, N. J., archts.

▲ **Jas. & Harvey Cosden,** 333 Hillcrest Rd., Englewood, N. J. Owner Builds. **$1,500,000.** 60 addnl. HOMES, on land adjoining development known as Oradell Village on Prospect Ave., ORADELL, N. J. Peter H. Butler, 172 State St. W., Englewood, N. J., archt.

▲ **Oaklyn Constr. Co.,** 14 Milfrank Place, Fords, N. J. Owner Builds. **$3,000,000.** 150 HOUSES, Hillcrest Manor, Chamberlain Ave. off Pfeiffer Blvd. (Rte. 440) PERTH AMBOY, N. J. Percy M. Ivory, 1087 Springfield Ave., Irvington, N. J., archt.

▲ **Spring Gardens, Inc.,** 645 Salem Rd., Union, N. J. Owner Builds. **$2,000,000.** 86 HOUSES to be known as Winchester Park, on Salem Rd., Minute Arms and Colonial Arms Rd., UNION, N. J. Erwin Gerber, 11 Commerce St., Newark 2, N. J., archt.

Hannig Bros., Wayne, Pa. Separate Contracts. **$500,000.** RESIDENTIAL DEVELOPMENT, Barton Lane, etc., BERWYN, PA.

Stefan Co., 3924 Darby Rd., Bryn Mawr, Pa. Separate Contracts. **$344,000.** RESIDENTIAL DEVELOPMENT, Cassatt Rd., etc., BERWYN, PA.

M & L Constr. Co., 108 S. 40 St., Phila., Pa. LB **$259,529.** Valley Forge Elementary SCHOOL, sewage disposal system, BERWYN, PA. Tredyffrin Twp. School Dist., Berwyn, Pa. CD 12/1/55.

▲ **Frank H. Wilson Co.,** 125 Coulter Ave., Ardmore, Pa. CA **$1,096,260.** general constr. Central JUNIOR HIGH SCHOOL, CHESTER, PA. School Dist., Ninth and Crosy Sts., Phila., Pa. Bids Feb. 5, awarded Mar. 6. CD 2/25, under LB.

▲ **Russell & Stanley Janney, Newtown, Pa.** Separate Contracts. **$2,520,000.** RESIDENTIAL DEVELOPMENT, Middletown Twp., Rte. 413, LANGHORNE, PA.

▲ **Elm Corp.,** Charles H. Dorsett, Feasterville, Pa. Separate Contracts. **$1,180,000. RESIDENTIAL DEVELOPMENT,** Middletown Twp., Rte. 413 near George School, LANGHORNE, PA.

Middletown Homes, Inc., 225 S. 69 St., Upper Darby, Pa. Separate Contracts. **$344,000.** RESIDENTIAL DEVELOPMENT, Middletown Twp., LIMA, PA.

W. A. Raynor, 1518 Walnut St., Phila., Pa. CA **$344,000.** RESIDENTIAL DEVELOPMENT, Kelly Ave., etc., MILMONT PARK, PA. Crumwald Bldg. Co., c/o Todd Cook-H. S. Green, 1518 Walnut St., Phila., Pa.

Abram Singer Sons, Inc., 906 Frog Hollow Terrace, Jenkintown, Pa. Separate Contracts. **$344,000.** RESIDENTIAL DEVELOPMENT, Benner St., etc., PHILA., PA.

Broad Constr. Co., 6333 N. Broad St., Phila., Pa. Separate Contracts. **$840,000.** RESIDENTIAL DEVELOPMENT, 60 units, Arnold St., etc., PHILA., PA.

Earl M. Kerstetter, 10 St., Pottstown, Pa. Separate Contracts. **$500,000.** RESIDENTIAL DEVELOPMENT, 35 units, Clearview St., etc., POTTSTOWN, PA.

Uniontown Constr. Co., 144 E. Main St., Uniontown, Pa. LB **$635,000** (11 bidders) general constr. secondary SCHOOL for Rockwood Joint School Bd., ROCKWOOD, PA. School Bldg Auth., 101 S. 25 St., Harrisburg, Pa. Bids Apr. 2. CD 3/14.

John Munz, 2100 Griffith St., Phila., Pa. Separate Contracts. **$525,000.** RESIDENTIAL DEVELOPMENT, 15 units, Rydal and adjoining Meadowbrook, RYDAL, PA.

Julius Godney, 50 W. End Ave., Somerville, N. J. Separate Contracts. **$93,000.** SHOWROOM, SALES OFFICE and GARAGE BLDG., SPRINGFIELD, PA. Johnson & Vogel, Rte. 69, Lebanon, N. J., archts.

Albert P. Mandes, Berwyn, Pa. Separate Contracts. **$344,000.** RESIDENTIAL DEVELOPMENT, 20 units, Green Tree Rd., etc., WILLISTOWN, PA.

▲ **Mark Building Co.,** 1606 Kelly Ave., Baltimore 9, Md. Owner Builds, **$1,220,000.** 2nd sect., 244 two story, brick DWELLINGS, Marbourae Ave., Harriet Ave., Lorena Ave., Southdone Ave., Huron Ave., BALTIMORE, MD.

▲ **Blake Constr. Co.,** 33 E. St. S.W., Wash., D. C. CA **$2,548,000.** concrete, steel, concrete block state OFFICE, ANNAPOLIS, MD. State, Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md. CD 3/15, under LB.

▲ **Ernest DiSabatino & Sons,** 2601 W. Fourth St., Wilmington, Del. CA **$1,891,050.** JUNIOR HIGH SCHOOL, NEW CASTLE, DEL. New Castle Special School Dist., New Castle, Del. Bids Apr. 3. CD 4/12/56.

SOUTH

HEAVY CONSTRUCTION—BA

† **S. C., Greenville**—HANGAR—BA 4/23—U. S. Eng., Custom House, Charleston, reserve forces hangar and pumping station, Donaldson Air Force Base, ENG-38-081-57-27. CD 3/12.

† **Va., Richmond**—BA 4/23—P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, roadway repair, Naval Diesel School, NBy-7745, Spec. 7745/57.

† **Fla., Jacksonville**—HEADQUARTERS—BA 4/24—U. S. Eng., Box 4970 Jacksonville, group headquarters bldg. Air National Guard, Imeson Airport, ENG-08-123-57-40. Extended date. Beiswenger-Hoch & Burns, Prudential Bldg., engrs-archts. CD 3/18.

† **Fla., Jacksonville**—FUEL STORAGE AREA—BA 4/2[illegible]—Officer in Charge of Constr., Bldg. 902, [illegible] Air Station, Jacksonville, fuel storage area, replac[illegible] fuel line from loading stands to storage area, [illegible] Air Station, NBy-10314, Spec. 10314/57. CD 8/[illegible]

† **Va., Yorktown**—BOILER REPLACEMENT, etc.—[illegible] 4/25—Dist. P. Wks. Office, Fifth Naval Dist. Bl[illegible] N-26, U. S. Naval Base, Norfolk, replacement [illegible] boiler and exten. of hot water heating lines, Na[illegible] Mine Depot, NBy-7698, Spec. 7698/56. CD 8/[illegible]

† **W. Va., South Charleston**—INDOOR RIFLE RANGE—[illegible] BA 4/25—Dist. P. Wks. Office, Fifth Naval Dis[illegible] Bldg. N-26, U. S. Naval Base, Norfolk, ind[illegible] rifle range, Marine Corps Reserve Training Cent[illegible] Naval Ordnance Plant, NBy-7709, Spec. 7709/57.

† **W. Va., Wheeling**—INDOOR RIFLE RANGE—[illegible] 4/25—Dist. P. Wks. Office, Fifth Naval Dist., Bl[illegible] N-26, U. S. Naval Base, Norfolk, Va., indoor r[illegible] range Naval & Marine Corps Reserve Training Cent[illegible] NBy-3805, Spec. 3805/56.

† **La., Shreveport**—HOSPITAL—BA 4/25—U. S. En[illegible] P. O. Box 867, Little Rock, Ark., modificatio[illegible] alterations to Hospital Bldg. No. 53, Barksdale [illegible] Force Base, ENG-03-050-57-37. CD 3/21.

† **Fla., Jacksonville** — BUILDING ALTERATIONS — [illegible] 4/26—Officer in Charge of Constr., Bldg. 902, Na[illegible] Air Station, Building No. 101 alterations, Ma[illegible] Air Station, NBy-10410, Spec. 10410/56. CD 8/[illegible]

† **Fla., Tampa**—BA 4/26—Contracting Officer, Macl[illegible] Air Force Base, Tampa, storage base, special, Macl[illegible] Air Force Base, Inv. 08-602-57-53. CD 8/24.

† **NORTH CAROLINA**—BA 4/26—Bureau P. Rds., D[illegible] Commerce, Gatlinburg, constr. 0.227 mi. masonry guardwalls at select[illegible] locations, Blue Ridge Parkway, Proj. 2V7.

Fla., Clearwater—BA 4/30—City, City Hall, Marsh[illegible] St. Sewage Treatment Plant. Plans deposit $5[illegible] Briley, Wild & Assocs., Box 3052, Daytona Bea[illegible] engrs. CD 12/28/56, under LB.

† **Va., Oceana**—HEATING PLANT—BA 4/30—Dis[illegible] P. Wks. Office, Fifth Naval Dist., Bldg. N-26, U. [illegible] Naval Base, Norfolk, heating plant expansion, Na[illegible] Air Station, NBy 10650, Spec. 10650/57. CD 8/2[illegible]

La. St. Joseph—BA 5/6—Mayor, water treatme[illegible] plant. Plans deposit $15, Pan American Eng. 10[illegible] Tenth St., Alexandria, engrs.

† **S. C., Parris Island**—THEATER—BA 5/7—Dist. [illegible] Wks. Office, Bldg. No. 13, U. S. Naval Base, Charle[illegible] ton, depot theater, U. S. Marine Corps Recruit Depo[illegible] Spec. 6497/56. Extended date. CD 3/29.

▲† **Kentucky**—BA 5/14—U. S. Eng., P. O. Box 107[illegible] Nashville, Tenn., Cofferdam, Barkley dam sit[illegible] 1,800,000 cu. yd. earth excav., Cumberland Rive[illegible] Livingston Co. $1,000,000.

† **Ky., Louisville**—ROCKET STORAGE—BA 5/14—[illegible] U. S. Eng., P. O. Box 59, rocket storage facilitie[illegible] Air National Guard Standiford Field, ENG-15-02[illegible] 57-67. $60,000-$100,000. CD 4/10.

† **S. C., Charleston**—PORTAL CRANES—BA 5/14—[illegible] P. Wks. Officer, Dpt. Navy, Naval Base, S. C., [illegible] portal cranes at Naval Industrial Reserve Shipyard, [illegible] NBy-10232. CD 6/25/52.

† **Fla., Sanford** — RUNWAY COUNTERPOISE SYSTEM, [illegible] etc. — BA 5/14 — Dist. P. Wks. Office, Buildin[illegible] No. 13, U. S. Naval Base, Charleston, S. C., Runwa[illegible] No. 9-27 counterpoise system and rehabilitation [illegible] taxiway lighting sys., U. S. Naval Air Station, NB[illegible] 10274, Spec. 10274/57. CD 8/27.

† **N. C., Wilmington**—BA 5/16—Dist. P. Wks. Offic[illegible] Bldg. No. 13, U. S. Naval Base, Charleston, S. C. [illegible] correction of erosion U. S. Marine Corps Auxiliar[illegible] Landing Field, NBy 4918, Spec. 4918/56.

† **La., Lake Charles**—DINING HALL—BA 5/21—U. [illegible] Eng., P.O. Box 1229, Galveston, Tex., masonry a[illegible] men's dining hall, Lake Charles Air Force Base. CD 4/[illegible]

BUILDINGS—BA

N. C., Rutherfordton—SCHOOL—BA 4/26—City School[illegible] elementary school. Plans deposit $40. Glenn[illegible] Harrill, Box 356, Andrews, archt.

Fla., Miami—SCHOOL—BA 5/1—Bd. P. Instructi[illegible] Dade Co., 275 N. W. 2 St., Palmetto Junior [illegible] Senior High School, S. W. 120 St. and S. W. 7[illegible] Ave., South Miami. Plans deposit $75. Irvi[illegible] Horsey, 9822 N. E. 2 Ave., Miami Shores Village[illegible] archt. CD 2/15.

† **Ky., Fort Campbell**—HOUSING—BA On Or Abou[illegible] 5/8—U. S. Eng., 306 Federal Office Bldg., Nashvill[illegible] Tenn., family housing, 35 buildings, utilities, ENG[illegible] 40-058-57-35. CD 4/9.

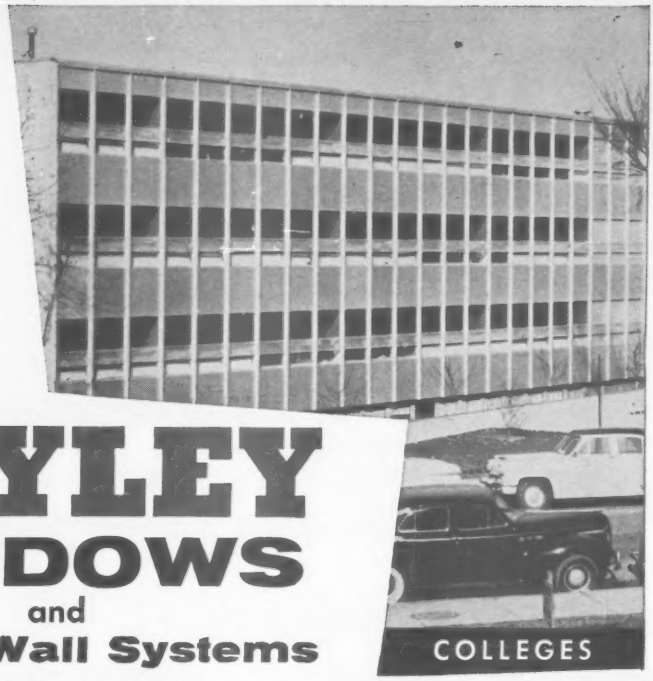
† **Ala., Huntsville**—SHOPS, etc—BA On Or About 5/1[illegible] —U. S. Eng., 2301 Grant St., Mobile, Zone 7, constr[illegible] Training Shop Buildings 3 and 4, boiler and compresso[illegible] house. ENG-01-076-57-84; Class and Laborator[illegible] Bldgs. 2, 3, and 4, ENG-01-076-57-82, at Redstone[illegible] Arsenal. CD 2/26.

BUILDINGS—SLC

Ga., Augusta—SHOPPING CENTER—Southgate Plaza, Inc. c/o Heery & Heery, archts., 1722 Peachtree St., Atlanta, soon lets contract. 142,000 sq. ft. shopping center.

Ga., Scottdale—MILL—Scottdale Mill, Scottdale, soon lets contract main mill addn. McPherson Co., 408 S. Main St., Greenville, S. C., engr.

(Continued on page 136)



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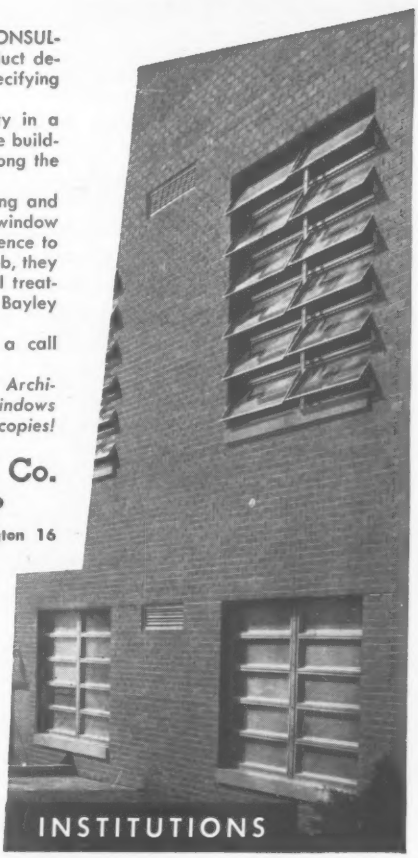
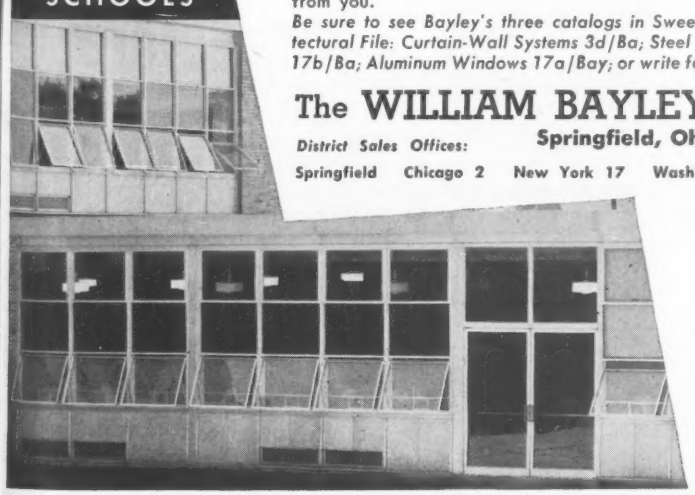


INSTITUTIONS

SCHOOLS



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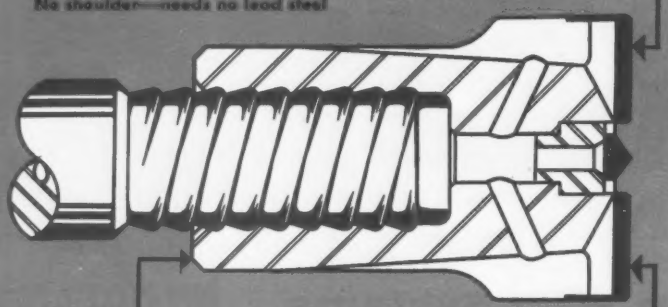

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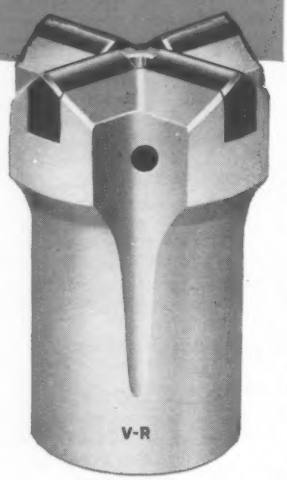
Carbide inserts "balanced-brazed" to eliminate stresses that cause failure



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(Continued from page 134)

▲ **Ky., Lexington**—MEDICAL CLINIC—Lexington Clinic Corp., Furgus Houston, admin., N. Upper St. soon lets contract 4 story, 54,000 sq. ft. medical clinic, $1,000,000, Brock & Johnson, 145 Barr St., archts.; Ellerbe & Assocs., First National Bank Bldg., St. Paul, Minn., assoc. archts., Staggs & Fisher, 506 E. Main St., Lexington, mech. engrs. Porter White 915 S. Limestone St., struct. engr.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys. Central Hy. Office Bldg., 1221 E. Broad St., Richmond, rejected bids Mar. 27, Contract D-4, highway and structures, Norfolk Approach Highway; LB $2,190,229. Contract N-1, Newport News connector highway and structures, LB $1,784,946. CD 4/1, under LB.

VIRGINIA—Richmond-St. Petersburg Turnpike Auth., 1015 E. Main St. or by mail P.O. Box 1-R, Richmond, **W. E. Graham & Sons**, P.O. Box 268, Cleveland, N.C., CA $806,338, Contr. A 4-S, Section A, viaduct constr., incidental grading, drainage, paving from point approx. 350 ft. east of Lombardy St. to point approx. 200 ft. west of S. A. L. R.R. city of Richmond. Bids Mar. 26. CD 3/29, under LB.

† **Laburnum Constr. Corp.**, 918 E. Main St., Richmond, Va. LB $453,000. (6 bidders) steam line to Santa Annex, Naval Base, NBy 3506, Spec. 3506 rev., NORFOLK, VA. Pub. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va.

† **NORTH CAROLINA**—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va., Bids opened 3/14. **Macon Constr. Co.**, Franklin, N.C., CA $748,317, gravel or stone base course and other work from US 421 at Deep Gap to Triplett Rd., Blue Ridge Parkway, Proj. 2F1. CD 3/21, under LB.

▲ **NORTH CAROLINA**—State Hy. & P. Wks. Comm., Raleigh,
N. C.—**Ballenger Paving Co.**, Box 927, Greenville, S. C., CA $2,694,940. subgrade, c. conc. 16.29 mi. U. S. 421 from point east of Kernersville to Greensboro, I-712 (4), U 712 (5), Forsyth and Guilford Counties;
N. C.—**Nello L. Teer Co.**, Trust Bldg., Durham, N. C., CA $744,778. subgrade rein.-con. 6.13 mi. U. S. 15 from point on U. S. 70 (Durham by-pass) northeast to point 0.6 mi. south of Neuse River, 4162, IN-663 (11), Durham Co.;
N. C.—**C. C. Mangum, Inc.**, Box 338, Raleigh, N. C., CA $522,609. grading 14.08 mi., roadway, Proj. 3437, Cumberland Co. Grand total $3,962,327. Bids Mar. 26, awarded Apr. 2. CD 4/1, under LB.

NORTH CAROLINA—State Hy. & P. Wks. Comm., Raleigh, **Columbus Contractors**, Whiteville, N. C. CA $561,362. structures 14.08 mi. on U. S. 301 from Eastover, northeast of Fayetteville, northeast to Harnett Co. line, Project 3437, I 703 (6), Cumberland Co. Bids Mar. 26, awarded Apri. 2. CD 4/1, under LB.

FLORIDA—State Rd. Dpt., Tallahassee,
J. D. Manly Constr. Co., Box 586, Leesburg, Fla., CA $609,528, limerock base with hot binder course, b. conc., surf. course, storm sewers 2.474 mi. SR 64, Job 1315-181, Manatee Co. Bids Feb. 12, awarded Apr. 2. CD 2/18, under LB.

Intercounty Constr. Corp., 2224 N.E. 12 Ave., Fort Lauderdale, Fla., LB $287,015. Central Negro Proposed Sanitary Trunk Mains No. 1 and 2, MIAMI, FLA. City Comm., City Hall, 3332 Pan American Dr., Miami, Fla. Bids Apr. 3. CD 3/20.

Edward M. Fleming Constr. Co., 4121 N.W. 25 St., Miami, Fla., LB $221,406, Part 2, hangar, Miami International Airport, MIAMI, FLA. L. B. Smith Aircraft Corp., Miami International Airport, Miami, Fla. Bids Apr. 3. CD 4/3.

Asphalt Paving Co., 1000 N.W. 57 Ave., Miami, Fla., LB $75,851. paving imprvs. District H-519, MIAMI, FLA. City Comm., City Hall, 3332 Pan American Dr., Miami, Fla. CD 9/28.

H. B. Hornsby, Bossier City, La. LB $204,296. (5 bidders) storm drainage facilities, Proj. D-1, BOSSIER CITY, LA. City, Bossier City, La. Bids Apr. 2. CD 3/29.

† **Hammond Iron Works**, 401 Ave. W., Pratt City, Birmingham, Ala. LB $94,000, est. $75,000. 500,000 gal. steel elevated water storage tank, U. S. Naval Station, NEW ORLEANS, LA. Officer in Charge of Constr., Eighth Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans (Algiers), La. Bids Mar. 26. CD 3/11.

▲† **Southern Builders, Inc.**, 495 W. 61 St., Shreveport La. CA $1,004,000, aircraft maintenance hangar at Naval Air Station, No. 6410, NEW IBERIA, LA. Eighth Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans, La. Bids Mar. 26, awarded Apr. 2. CD 3/29, under LB.

† **Chaney & Hope**, 5015 W. Mockingbird Lane, Dallas, Tex. CA $653,929, hydrant fueling system, Columbus Air Force Base, ENG-01-076-57-67, COLUMBUS, MISS. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids Mar. 28, awarded Apr. 1. CD 4/4, under LB.

Albert J. Lubrecht, 510 Keene St., Covington, Ky. LB $147,000. cargo bldg. addn., Boone County Airport, ERLANGER, KY. Kenton Co. Airport Bd., Third and Court Sts., Covington, Ky. Howard Elliston, 706 Walnut St., Cincinnati, O., archt. Hall-McAllister & Stockwell, 706 Walnut St., Cincinnati, O., engrs. CD 2/20/56; **W. L. Harper Co.**, 2910 Highland Ave., Norwood, O. LB $248,600. apron and runway expansion (Erlanger, Ky. O.)

(Continued on page 139)

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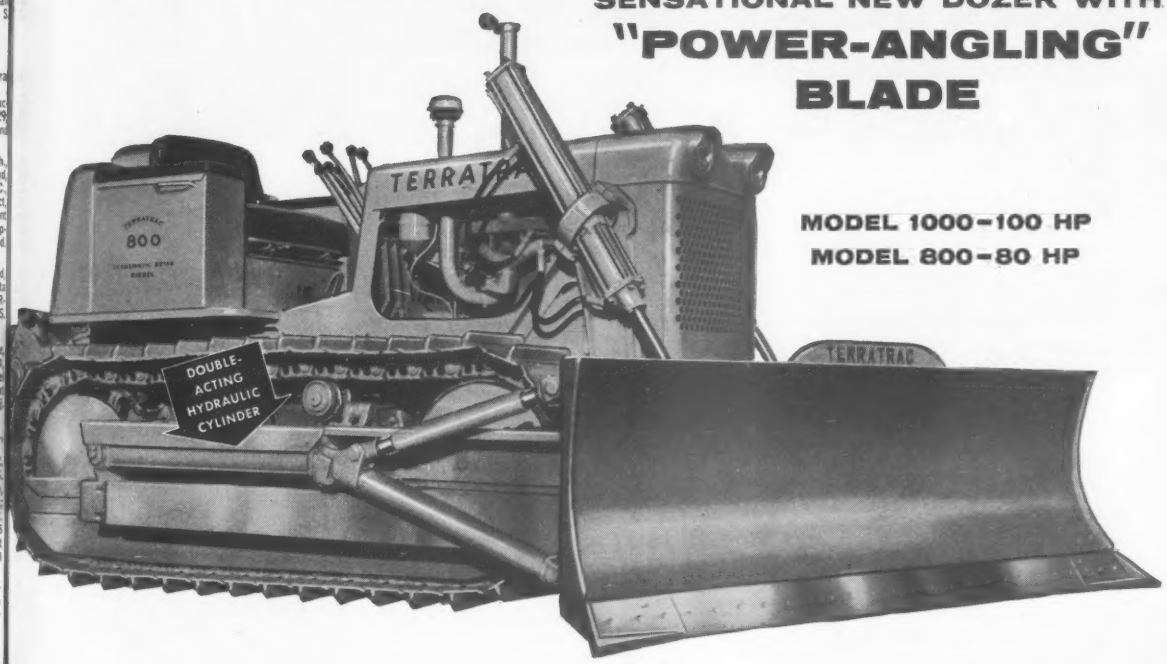

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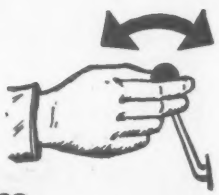
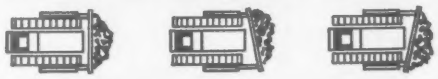


and blade angles
HYDRAULICALLY...



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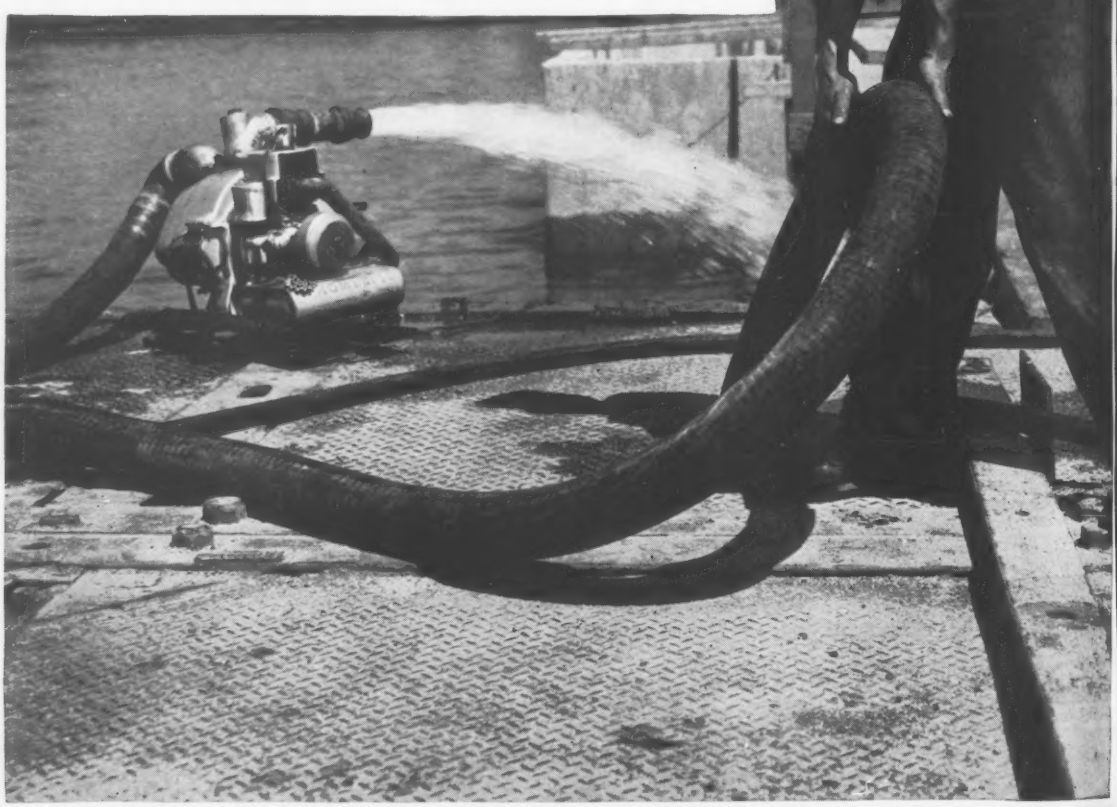


(Continued from page 136)

TENNESSEE—State Hy. Dpt., Nashville, ...—McDowell & McDowell, 718 Murfreesboro Rd., ...shville, Tenn., CA $987,041. crushed stone, bit. pav-...g, conc. box type bridge, 1 concrete, steel bridge for ...terchange with State Rt. 7 on section 1.791 mi. In-...erstate Rte. 504, Proj. IN-504 (2) Giles Co.; CA ...1,460,212, crushed stone, bit. surf., 4 bridges 7.893 ...i. State Rte. 29, Proj. F-031-1 (5) Scott Co.; CA ...856,623 surf. with crushed stone, b. on section, State ...te. 40, 5.699 mi. Proj. F-040-1 (1) Polk Co.; ...n.—J. A. Hadley Constr. Co., Humboldt, Tenn., CA ...557,003. wid'n., bit. resurf. 9.607 mi. State Rte. ...o. 5, SP-2000-A, Gibson Co.; ...n.—Southern States Paving Co., 900 44 Ave. N., Nash-...ille, Tenn., CA $550,305. wid'n., bit. materials resurf. ...1.9 mi. section of State Rte. 6, SP-1193-B, Maury ...Co.;

...n.—Burton Constr. Co., Winchester, Tenn., CA $660,-...895, crushed stone, bit. materials surf., 2 concrete deck ...girder bridges 5.04 mi. section on State Rte. 1, F-001-6 ...11) Pt. II, Cumberland Co. Grand total $5,072,079. Bids Mar. 4. CD 3/20, under LB.

+ TENNESSEE—Bureau P. Rds., Dpt. Commerce, Get-...tysburg,

...erson Constr. Co., Maryville, Tenn., CA $1,203,913. ...Proj. 15-A-3, grading, draining, tunnel, steel girder ...bridge, 4 concrete box culverts, road work on north-...bound roadway from Bent Field to Caney Creek, Foot-...hills Parkway. Bids Mar. 21, awarded Apr. 9. CD 3/25, ...under LB.

TENNESSEE—Bureau P. Rds., Dpt. Commerce, First ...Natl. Bank Bldg., Florence, Ala. Bids opened 3/15, ...ss-Thornton Co., Box 127, Leeds, Ala., CA $979,700, ...Proj. IFI, grav. or stone base course 8.798 mi. Natchez ...Trace Parkway. Bids Mar. 15, awarded April 1. CD ...3/21, under LB.

UILDINGS—LB & CA

...gene Simpson & Bro., 300 Montgomery Ave., Alexan-...dria, Va. CA $667,950, (4 bidders) Lyles Crouch ...Elementary SCHOOL, ALEXANDRIA, VA. Bd. Educ., ...City Hall, Alexandria, Va. Bids Dec. 5, awarded Apr. ...1 CD 12/11, under LB.

J. W. Enochs, P.O. Box 585, Hopewell, Va. LB $372,-...997, 30 family HOUSING UNITS, ENG-44-110-57-17, ...FORT LEE, VA. U. S. Eng., foot of Front St., Nor-...folk, Va. Bids Mar. 27. CD 3/20.

+ Dawson Eng. Co., 10 Gillon St., Charleston, S. C., ...CA $2,193,525. imprv. mobilization type BARRACKS, ...No. 38-042-47-70, FORT JACKSON, S. C. Purch. & ...Contg. Office, Dpt. Army, Fort Jackson, S. C. Bids Feb. ...28, awarded Mar. 29. CD 3/5, under LB.

T. C. Brittain Co., Drawer B, Decatur, Ga., LB $1,-...173,027. Tilson Road High SCHOOL, DECATUR, GA. ...DeKalb Co. Bd. Educ., DeKalb Bldg., Decatur, Ga. ...Bids Apr. 2. CD 3/15.

J. E. Posey Jr., Co., Inc., Box 488, East Point, Ga., LB ...$407,225. low-rent HOUSING, Proj. GA 152-1A and ...152-1B, SYLVANIA, GA. Sylvania Housing Auth., Syl-...vania, Ga. Bids Apr. 2. CD 4/1.

...ant Constr. Co., Inc., 360 N.W. 27 Ave., Miami, Fla., ...LB $366,800, Alt. 1, deduct $935. Natural Bridge Ele-...mentary SCHOOL, 1695 N.E. 141 St., North Miami, ...MIAMI, FLA. Bd. P. Instruction, Dade Co., 275 N.W. ...2 St., Miami, Fla. Bids Apr. 3. CD 3/8.

A. Thompson & Street Co., 505 Builder's Bldg., Char-...lotte, N.C., CA $6,209,000, MANUFACTURING ...PLANT, OFFICES, etc. S. Orange Blossom Trail, 12 ...Square Mile Tract, ORLANDO, FLA. Glenn L. Martin ...Co., 431 E. Central Ave., Orlando, Fla. Bids Mar. ...26, awarded Apr. 3. CD 4/2, under LB.

J. S. I. Industries, c/o Emory L. Jackson, archt., 42 ...N.E. 54 St., Miami, Fla., cancelled bids to have ...been opened Apr. 16, TECHNICAL CENTER, N.E. 12 ...Ave. and 39 St., POMPANO BEACH, FLA. Will re-...advertise. CD 4/4.

C. A. Paul Co., 2711 S. 20th St., Birmingham, Ala., LB ...$402,958. est. $400,000, (8 bidders) FINE ARTS ...BLDG., Lakeshore Dr., Homewood, BIRMINGHAM, ALA. ...Howard College, 7725 Second Ave. S., Birmingham, ...Ala. Bids Apr. 3. CD 3/28.

▲ Pierce & Gresham, Decatur, Ala., CA $1,007,154. ...NORTHEAST JUNIOR HIGH SCHOOL, HUNTSVILLE, ...ALA. City Bd. Educ., Huntsville, Ala., Van Keurne, ...Davis & Co., 3004-7th Ave. S., Birmingham, Ala., ...archts. Bids Feb. 20, awarded Apr. 2. CD 2/26, under ...LB.

Horace B. Rickey, Inc., P. O. Box 520, Lafayette, La. ...CA $500,000. APARTMENT, LAFAYETTE, LA. Hey-...mann Oil Center, Maurice Heymann, Lafayette, La. ...A. Haystown, Triad Bldg., Baton Rouge, La., archt.

W. A. McMichael Constr. Co., Box 508, Shreveport, La. ...LB $378,844. (6 bidders) Negro Elementary SCHOOL, ...Holly Heights subdivision on McDaniel Dr. across from ...Municipal Airport, SHREVEPORT, LA. Caddo Parish ...School Bd., Shreveport, La. Bids Apr. 3. CD 3/18.

F. W. Owens Co., 119 N. Fifth St., Louisville, Ky. LB ...$428,900 (5 bidders) Ninde S. Wilder Elementary ...SCHOOL on Herr's Lane, LOUISVILLE, KY. Jefferson ...Co. Bd. Educ., 618 W. Jefferson St., Louisville, Ky. ...Bids Apr. 4. CD 4/1.

Victory Constr. Co., Knott Bldg., Dayton, O. LB $604,-...698. (2 bidders) seven 2 story, brick HOUSING ...BLDGS., 50 units, Isabella St., NEWPORT, KY. New-...port Municipal Housing Comm., Fourth and York Sts., ...Newport, Ky. Bids Mar. 28. CD 2/27.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Wis., Milwaukee—BA 4/15—City, City Hall, sewers in N. Van Buren, N. 61 St., S. 27 St. W. Marion St. and W. Lawrence Ave. $110,000. Plans deposit $10. E. A. Schmidt, city engr. CD 11/26.

Ind., Fort Wayne—BA 4/16—Bd. P. Wks., City Hall, imprv. portions Buchanan, Florida Dr. Harrison and Eliza Sts. CD 8/22/46.

▲ ILLINOIS—BA 4/25—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

Contr. T-13-B, grading, drainage, paving, appurtenances, erecting precast concrete bridges 5.09 mi. beginning N. of Town Line Rd. and extending northerly N. of Skokie Hy. $5,000,000. Roberts & Schaefer Co., and Rummel, Klepper & Kahl, Waukegan, Ill., section engrs. CD 5/11.

O., Wooster—BA 4/25—City, City Hall, Little Apple Creek Sewer line, $350,000. Jones, Henry & Williams, Security Bldg., Toledo engrs. CD 3/20/56.

Wis., Beloit—BA 4/29—City, City Hall, sewage treatment plant, 2 lift stations and sewers, $950,000. Plans deposit $25. Jensen & Johnson, 108 W. Court St., Elkhorn, engrs. CD 2/7.

INDIANA—BA 4/30—State Hy. Dpt., State House Annex, Indianapolis

Delaware Co.—paving, grading, drainage 0.944 mi. Road No. 67, from 0.1 mi. southwest of S.R. 3 to 26 St. at Muncie, Road Contr. No. R-4114, Proj. No. F-72 (12), Plans deposit $5.75.

Kosciusko Co.—paving, grading, drainage 1.033 mi. Road No. 30 from 0.5 mi. west to 0.5 mi east of Atwood, Road Contr. No. R-4117, Part "B" F-66 (20). Plans deposit $5.25.

Morgan and Johnson Counties—bit. base widn. and resurf. 6.67 mi. S.R. 135 from Marion and Washington Sts. in Morgantown to Trafalgar, Proj. Road Contr. No. RS-4112, Proj. S-300 (2). Plans deposit $1.

Parke and Montgomery Counties—bit. base widn. and resurf. 16.93 mi. and bit. with concrete base 0.718 mi. S.R. 47 from U. S. 41 via Turkey Run State Park to county road west from New Market. Contr. No. RS-4113 Proj. S-390 (1), Plans deposit $2.50.

paving, grading, drainage 6.213 mi. Road No. 236, from 0.12 mi. west of Parke-Montgomery Co. Line to S.R. 43 South of Raccoon, Road Contr. No. R-4115, S-368 (3), Plans deposit $7.75.

Wayne Co.—paving, grading, drainage 4.791 mi. Road No. 27, from 1.5 mi. south of Fountain City to just south of Wayne-Randolph Co. Line, Road Contr. No. 4116, F-402 (10), Plans deposit $7.75.

Wis., Mazomanie—BA 4/30—City City Hall, sewage treatment plant, 35,000 ft. sewers. Plans deposit $15. John A. Strand, 2020 University Ave., Madison, engr. CD 10/10/52.

Wis., Independence—BA 5/2—City, sewers, sewage treatment plant. Plans deposit $15. Davy Eng. Co., La Crosse, engrs.

† Illinois—BA 5/10—U. S. Eng., 420 Locust St. St. Louis 2, Mo. imprv. levees in Wood River Drainage & Levee Dist., Proj. Item V-B (2), Madison Co., CIVENG-23-065-57-78. CD 11/9/55.

BUILDINGS—BA

O., Huron—SCHOOL—BA 4/23—Huron School Dist., Huron, high school $989,000. Bueher & Stough, 1029 Sylvania St., Toledo, archts. CD 11/21.

O., Cincinnati—MOTEL—BA 4/29—Howard Johnson's Restaurant, 7800 Reading Rd., U-shaped motel in rear of present restaurant. $350,000. Plans deposit $25. Sullivan-Isaacs-Sullivan 1800 Reading Rd., Reading, archts. C. Louis Zull, 1015 Vine St., engrs. CD 12/6.

▲ Wis., Madison—DORMITORIES, etc.—BA 5/2—University of Wisconsin, Madison, two men's dormitories and food service bldg. $2,100,000. Plans deposit $50. Mittelbusher & Tourtelot, 36 S. State St., Chicago, Ill., archts. CD 1/3.

Ill., East Moline—POWER PLANT—BA 5/7—State Div. Architecture & Eng. Armory-Office Bldg., Springfield, general, power piping and equip., pipe covering and insulation, 1,000 kw turbine generators, boilers and accessories, electrical underground distr. and D.C. to A.C. conversion, electrical wiring, new power plant, East Moline State Hospital. CD 4/9/45.

O., Chagrin Falls—SCHOOL—BA 5/8—Orange School Bd., 32000 Chagrin Blvd., East Elementary School and high school remodeling, Orange. $750 000. Plans deposit $35. Outcalt, Guenther & Assocs., 13124 Shaker Sq., Cleveland, Zone 20, archts. CD 11/20.

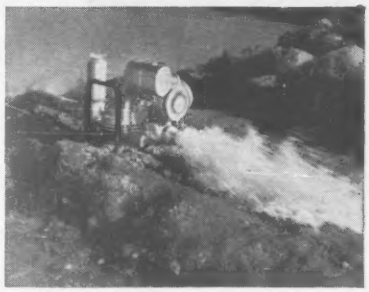
▲ Ind., Gary—EDUCATION CENTER—BA 5/9—At office J. A. Franklin, vice pres. and treas. Indiana University, Bloomington, adult education center, Indiana University. $1,500,000. Plans deposit $60, Beine, Hall & Curran, Inc., 607 Broadway, Gary, archt. CD 8/17/55.

▲ O., Cincinnati—SCHOOL—BA About 7/1—Oak Hill School Dist., 3900 Race Rd., high school, Ebenezer Rd., $2,400,000. George Schatz & Assoc. 309 Ludlow Ave., archts. CD 11/9.

BUILDINGS—SLC

Ill., Chicago—WAREHOUSE, etc.—International Parts Corp., 1021 S. State St., soon lets contract 1 story, 185,000 sq. ft., brick warehouse and office bldg., railroad tracks, 4101 W. District Blvd. $800,000. A. Epstein & Sons, Inc., 2011 W. Pershing Rd., archts.

Full Line of Carryable Construction Equipment Now Offered by Homelite



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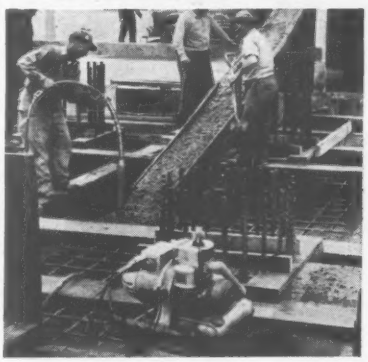

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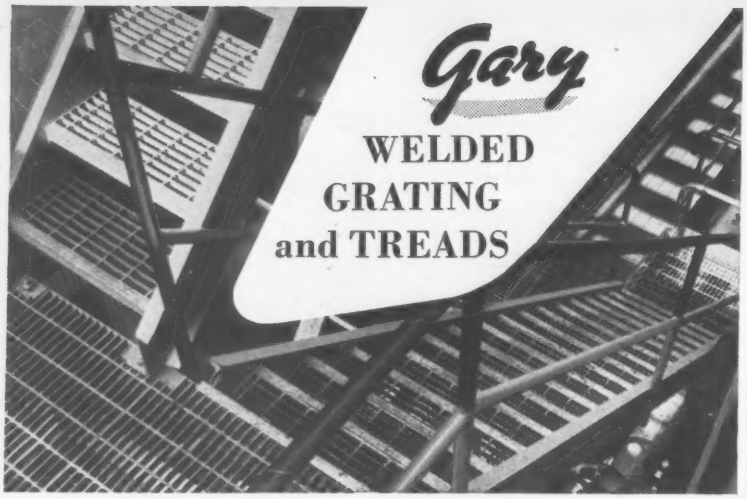

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Wis., Rhinelander—PLANT—Rhinelander Paper Rhinelander, soon lets contract, steam generating $635,000. Pfeifer & Shultz, Wesley Temple Minneapolis, Minn., engrs. CD 3/21.

HEAVY CONSTRUCTION—LB & CA

OHIO—Dpt. Hys., Columbus, Zone 15. Bids opened
O.—C. P. Calaway, 1220 Madison Ave., Toledo O. LB **$168,220,** est. $196,000 (6 bidders) Type on B-119 and structure 0.733 mi. SR 66-7.92, S (2), Fulton Co.;
O.—The W. J. Seidensticker Co., 3585 E. Fulton Columbus 13, O. LB **$180,912,** est. $190,800 (6 ders) Type T-35 on B-20 and structure 0.406 mi. 271-(7.29-743), S-1197 (1), (Village of Kimbol Guernsey Co.;
O.—W. E. Ringwald & Sons, 42 E. Second Chillicothe, O. LB **$109,900,** est. $131,900 bidders) Type T-35, 0.652 mi. SR 725-(0.0 (12.85), (15.54), (17.23), Montgomery Co.;
O.—Walter L. Follmer, P. O. Box 173, Hamilton, LB **$83,304,** est. $95,050. (4 bidders) Type T- B-35 and T-35, 16.2 mi. Clermont, Clinton, Hamil and Warren Counties;
O.—cancelled bids to have been opened Apr. Type T-135, 1.56 mi. SR 5-7.23 (City of Warr Trumbull Co. CD 3/18.

Beacon Constr. Co., 138 E. Court St., Cincinnati, O. **$102,804,** est. $115,000. swimming, wading p Summit Rd., CINCINNATI, O. United Jewish Se Agencies, 1430 Cen. Parkway, Cincinnati, O. We Becker, 3427 Corrine Ave., Cincinnati, O., arc Awarded Mar. 30.

Fred Haddad, Inc., 3819 Woodridge Rd., Cleve Heights, O. LB **$79,845** (10 bidders) Imprvt. 342 sewers in Chelmsford and Marsol Rd. In County Se Dist. No. 3, Mayfield Heights, CLEVELAND, O. Cou Cuyahoga Co., Court House, Cleveland 13, O. B Apr. 1. CD 3/18.

Albert M. Higley Co., 2036 E. 22 St., Cleveland O. CA Est. **$142,600.** electric substation, 17 Hamilton Ave., CLEVELAND, O. Cleveland Elec Illuminating Co., 75 Public Square, Cleveland 13,

Jechura Brothers, 5700 Telegraph Rd., Toledo, LB **$250,000.** intercepting sewers, SWANTON, City, Swanton, O.;
Focht Bros. Inc., Tiffin, O. LB **$186,000.** sewa treatment plant (Swanton, O.)

W. J. Gallagher Co., 1616 Covington St., Youngsto O. CA **$225,726.** sewerage sys., WAYNESBURG, Village, City Hall, Waynesburg, O. Lester Weinber Cuyahoga Falls, O., engr. Awarded Mar. 28;
Melbourne Bros. Constr. Co., Mellet Bldg., Canton, CA **$89,000.** sewage disposal plant (Waynesburg,

† **Huffman-Wolfe Co.,** 669 N. High St., Columbus, LB **$138,232,** est. $146,890. aviation fuel stora facilities, Clinton County Air Force Base, ENG-4 022-57-22, WILMINGTON, O. U. S. Eng., 2 Fourth Ave., Huntington, 18, W. Va. Bids Apr. CD 3/8.

† **U. S. Eng.,** P.O. Box 59, Louisville 1, Ky., cancel bids to have been opened Apr. 10, bank stabilizatio New Harmony Bridge, New Harmony, CIVENG-15-02 57-60, INDIANA. CD 3/13.

Witter Gaddis Corp., Rte. 30, Schererville, Ind. **$720,000.** intercepting sewers addn., 11 and Aves., GARY, IND. City, Gary, Ind. CD 6/21/

Meriwether & Bauman, Georgetown, Ind. LB **$66,20** water purification plant, LANESVILLE, IND. To Town Hall, Lanesville, Ind. Southern Indiana E Co., 725 Washington St., Columbus, Ind. eng Bids Mar. 29.

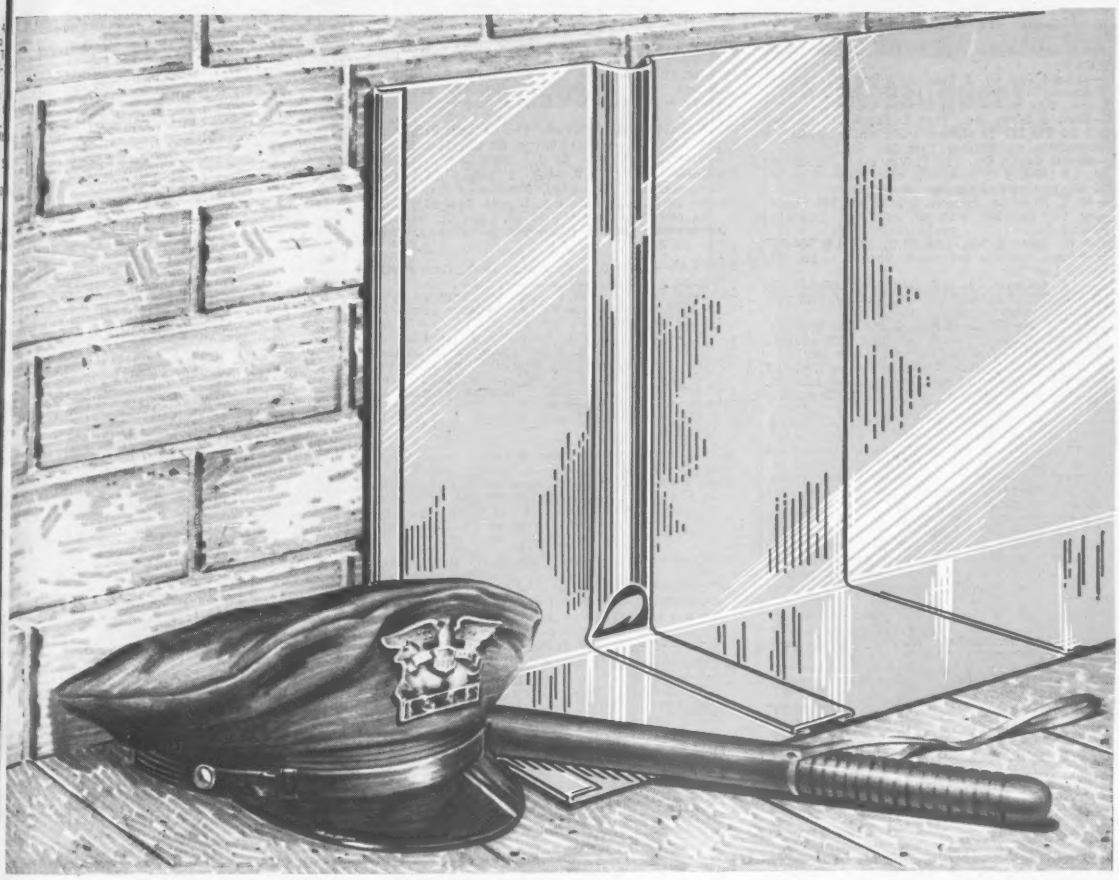
ILLINOIS—State Dpt. P. Wks. & Bldgs. Div. H Centennial Bldg., Springfield. Bids opened 4
Ill.—Wendnagel Co., Inc., 600 W. Cermak St., Chica Ill. LB **$228,993** (5 bidders) structural steel two grade separation structures Northwest Expre way over Kimball Ave. Proj. I-02-2 (35), F.A.I. Ro 2, District No. 10, Cook Co. LB **$167,792** bidders) structural steel for grade separation str ture carrying Northwest Expressway over Damen Av Proj. I-02-2 (22), F.A.I. Route 2 District No. Cook Co.;
Ill.—Sangamo Constr. Co., 700 N. MacArthur Springfield, Ill. LB **$92,538** (4 bidders) prec deck bridge, FAS 725, southwest of Hillsbo Proj. S-817 (1), District 8, Montgomery Co.;
Ill.—McCann Co., Inc., 2145 Divereaux St., Sprin field, Ill. LB **$249,452** (3 bidders) 4-span gra separation structures, FA 132 over Rogers Ave. ne Alton, Proj. U-380 (9), District 8, Madison Co.;
Ill.—Illinois Steel Bridge Co., 205 Allen Ave. Jac sonville, Ill. LB **$306,801** (5 bidders) furnishin structural steel for 4 superstructures over Quee Lake, Queens Lake Overflow over Kaskaskai Riv and over Kaskaskia River Overflow all on Ill. Rou 15, Proj. F-260 (2), S.B.I. Route 15 (Marke Ill. Route 15) District 8, Clinton and Washingt Counties. CD 3/27.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., 20 Wacker Dr., Chicago,
American Bridge Div., U. S. Steel Corp., 208 S. L Salle St., Chicago, Ill. CA **$1,251,720,** Cont. ST- fabricating, erecting structural steel for superstruc ture beginning N. of town of Robbins and crossin Calumet Sag Channel to point 350 ft. of Villag of Alsip. Bids Mar. 28. CD 4/2, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Cen tennial Bldg., Springfield. Bids opened 4/5.
Ill.—**Sankey Bros., Inc.,** 942 Illinois Bldg., Springfield, Ill., LB **$143,760** (9 bidders) c. conc. base course wid'n. 12.83 mi. Beardstown north, SBI 100, Cass

(Continued on page 142)

Chase® copper base flashing expansion joint



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Continued from page 140

and Morgan Counties; LB $292,534 (3 bidders) resurf. 12.84 mi. SBI 100, Beardstown south, Cass and Morgan Counties;

Ill.—**Howell Asphalt Co.**, 1020 N. 13 St., Mattoon, Ill., LB $137,353 (3 bidders) patching and resurf. 9.37 mi. District 7, Clark, Clay, Crawford, Cumberland, Edwards, Effingham, Jasper, Lawrence, Richland and Wayne Counties; LB $193,475 (4 bidders) patching and resurf. 2.52 mi. S.A. Rt. 4, District 5, Coles, Cumberland, Douglas, Macon, Moultrie and Shelby Counties;

Ill.—**Calumet Coal Co. & Chas. J. Wilson Co.**, 7601 S. Wentworth St., Chicago, Ill., LB $945,454 (6 bidders) c. conc. 0.24 mi. FAI-9 on 130 St., Cook Co.;

Ill.—**Knott & Mielly, Inc.**, 7724 S. Racine St., Chicago, Ill., LB $93,357 (3 bidders) traffic control signals, 7 intersections near Chicago, Cook Co.;

Ill.—**Ninora Constr. Co.**, 139 E. Van Buren St., Joliet, Ill., LB $96,613 (5 bidders) b. conc. resurf. 5.25 mi. US 66, southwest of Gardner, Grundy Co.;

Ill.—**W. L. Miller Co.**, Elvaston, Ill., LB $88,996 (2 bidders) bit. seal coat 4.19 mi. FAS 428, Elderville, Hancock Co.;

Ill.—**Peter Baker & Son**, Lake Bluff, Ill., LB $84,407 (2 bidders) patching and resurf. District 1, SBI 22, SA-10, Lake Co.;

Ill.—**J. P. Hollerich Co.**, P.O. Box 214, LaSalle, Ill., LB $102,238 (3 bidders) bit. surf. 8.67 mi. FAS 260, Troy Grove south, LaSalle Co.;

Ill.—**Earl Walker-Sullivan Marion County Co.**, Centralia, Ill., LB $380,846 (3 bidders) bit. surf. 7.38 mi. FAS 791 and 792, Central City easterly, Marion Co.;

Ill.—**Litchfield Bituminous Corp.**, Hillsboro, Ill., LB $134,585 (3 bidders) resurf. 6.02 mi. and 1.11 mi. U.S. 66, south and north of Litchfield, Montgomery Co.;

Ill.—**Sangamo Constr. Co.**, 700 N. MacArthur St., Springfield, Ill., LB $145,397 (3 bidders) b. conc. resurf. 10.46 mi. SBI 10, east of New Berlin, Morgan and Sangamon Counties;

Ill.—**Jessee H. Freeman, Inc.**, 1608 Fifth Ave., Moline, Ill., LB $186,692 (4 bidders) c. conc. 2.14 mi. FAS 537 and 538, Deland north, Piatt Co.;

Ill.—**Gilmore Asphalt, Inc.**, Anna, Ill., LB $171,612 (2 bidders) patching and resurf. 8.95 mi. District 9, Randolph, Union, Jackson, Pulaski and Perry Counties;

Ill.—**McCarthy Improvement Co.**, Kahl Bldg., Davenport, Iowa, LB $137,030 (3 bidders) resurf. and patching 11.21 mi. District 2, Rock Island, Mercer and Henry Counties;

Ill.—**M. Hoeffken Co., Hoeffken Bros., Inc.**, 222 W. "B" St., Belleville, Ill., LB $156,623 (2 bidders) c. conc. patching 79.3 mi. District 8, St. Clair, Madison, Bond, Clinton and Montgomery Counties;

Ill.—**Gund-Graham Co.**, State Bank Bldg., Freeport, Ill., LB $102,878 (1 bidder) c. conc. resurf. 0.55 mi. SBI 74, Cedarville, Stephenson Co.;

Ill.—**R. A. Cullinan & Son**, Tremont, Ill., LB $187,875 (1 bidder) grav. course 5.26 mi. FAS 465, 1 mi. south of Pekin west, Tazewell Co.;

Ill.—**Robert A. Shaw, Inc.**, 13912 S. Halsted St., Chicago, Ill., and **Lewis Shaw**, Decatur, Ill., LB $1,296,825 (3 bidders) c. conc. base wid'n 5.4 mi. and 6.24 mi. SBI 1, Mt. Carmel north, Wabash and Lawrence Counties;

Ill.—**Starr Eng. Co.**, 1 S. Eastern Ave., Joliet, Ill., LB $132,426 (4 bidders) grav. course 3.98 mi. FAS 295, north of Lennox, Will Co.;

Ill.—**Charles O'Brien & Son**, Baum Bldg., Morris, Ill., LB $112,395 (4 bidders) grav. course 4.23 mi. FAS 1273, south of Morris, Grundy Co.;

Ill.—**J. Wetherby Co.**, Ottawa, Ill., LB $75,974 (2 bidders) bit. surf. 6.27 mi. from Mendota Southwest, FAS 270 and 256, La Salle Co.;

Ill.—**Suburban Oil Co.**, 7340 W. 15 St., Forest Park, Ill., LB $87,745 (4 bidders) bit. surf. 6.02 mi. FAS 27 south of Harvard easterly, McHenry Co. CD 3/27 and 3/29.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago, Ill.,
rejected bids Mar. 21, Contract T-2-C, grading, drainage, paving, appurtenances, precast concrete bridges 2.45 mi., S. of 11 St. extending northerly to S. of 95 St., Cook Co., LB $4,783,624. CD 3/26, under LB.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,
Gust K. Newberg Constr. Co. & Boyle-Newberg Constr. Co., 2040 N. Ashland Ave., Chicago, Ill., CA $5,059,002 Contr. T-11-B, grading, drainage, paving, appurtenances, constr. precast concrete and structural steel bridges beginning W. of Huehl Rd. exten. easterly to point 239 ft. N. of Dundee Rd. 4.519 mi. Bids Mar. 29. CD 4/2, under LB.

Hoeffken Co. & Hoeffken Bros. Inc., 222 W. B St., Belleville, Ill. CA $559,769. imprv. Sect. 169-MFT, S.A. Rte. 42 and 42 Exten. near BELLEVILLE, ILL. Bd. Supervs. St. Clair Co., Court House, Belleville, Ill. Bids Mar. 11. CD 3/25, under LB.

J. M. Corbett Co., 2500 Corbett St., Chicago, Ill., LB $661,081. grade separation and bit. paving Ashland and Archer Sts., CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 6/24/54.

▲ **Santucci Constr. Co.**, 5025 Church St., Skokie, Ill., LB $1,393,899. sewer addn., Northwest Route and discharge conduit, Proj. 1-02-2 (52) CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Mar. 14. CD 2/25.

Bloomer Truck & Shovel Co., Bloomer, Wis., LB $130,992. sewage treatment plant, PORTAGE, WIS. City, City Hall, Portage, Wis. Bids Mar. 28. CD 3/14.

Oak Constr. Co., 220 E. Seventh St., Royal Oak, Mich. LB $411,532, est. $569,000 (16 bidders) road work Contr. No. 1, ROYAL OAK, MICH. City, Gladys Holmes, clk., City Hall, Royal Oak, Mich. Bids Apr. 2. CD 3/25.

ILLINOIS—State Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield, Bids opened 3/1,
Thos. McQueen Co., 1313 S. Circle Ave., Forest Park, Ill., CA $533,744, 4-span steel subway structure, FA 122, Calumet Expressway, Cook Co. CD 3/7, under LB.

▲ **ILLINOIS**—State Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,
Ill.—**Robert R. Anderson Co.**, 4550 W. Patterson St., Chicago, Ill., CA $1,683,097. retaining wall and paving in Oak Park on Congress St. Expressway, Cook Co.;
Ill.—**Frank C. Feutz Co.**, Paris, Ill., CA $651,218. bit. surf. 15.32 mi., grav. 13.88 mi. FA Rte. 160, Effingham and Clay Counties. CD 3/7, under LB.

ILLINOIS—State Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield, Bids opened 3/1,
Gunther Constr. Co., Galesburg, Ill., CA $130,573, concrete base course wid'n. 0.98 mi. Losey St. from N. Henderson to North Seminary Sts. in Galesburg, Knox Co. CD 2/19.

MICHIGAN—State Dir. Purchases, Lewis Cass Bldg., Lansing,
Bethlehem Steel Co., 701 E. Third St., Bethlehem, Pa. CA $348,447. structural steel for bridge on relocation US-127 over US-12 BR 2.5 mi. of Jackson, MB4 of 38-7-13; structural steel for bridge on relocation of US-127 over NYC R.R. 2.5 mi. southeast of Jackson, MX1 of 38-7-13; structural steel for bridge relocation US-127 over N. Y. Central R.R. 3.5 mi. southeast of Jackson, all in Jackson Co.; and structural steel for bridge on Whittier Ave. over Edsel Ford Expressway, B1B92 of 82-22-10, Wayne Co. Bids Mar. 7. CD 2/28.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Brown Brothers, 3245 W. St. Joseph St., Lansing, Mich. CA $1,667,095, est. $1,640,000. bascule bridge US-31, Grand Haven-Ferrysburg, BU B1 of 70-113-6 C2-UO (U 155 28), (70014), Ottawa Co. CD 3/29, under LB.

MICHIGAN—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,
Hoffman Brothers, 355 Dickman St., Battle Creek, Mich. CA $565,580, est. $600,000. 25 ft. aggregate base course prime and double seal 8.834 mi. on relocation of M-90 from Brown City east to M-19, M 74023 C1-R, Sanilac Co. CD 3/29, under LB.

▲ **Miller Thompson Constr. Co.**, 20958 Grand River, Detroit 19, Mich. LB $1,058,000. Contr. PW-2128 (B1), substructure Woodmere Pumping Station, Patton Park, DETROIT, MICH. City, Glenn C. Richards, comr., Dpt. P. Wks., 528 City County Bldg., Detroit, Mich. Bids Apr. 2. CD 2/27.

W. F. McNally Co., Bridgeport, Mich. CA $118,882. C-629, c. conc. various streets, SAGINAW, MICH. City, R. A. Benway, purch. agt., City Hall, Saginaw, Mich. Grand total $590,907. Bids Mar. 19. CD 3/6.

E. W. Graft Constr. Co., 2870 Harrison St., Saginaw, Mich. CA $132,255. c. conc. (Saginaw, Mich.);
Kutchins Co., Inc., 3112 Sablain Parkway, East Lansing, Mich. CA $339,770. C-629, 35 streets paved with b. conc., (Saginaw, Mich.).

BUILDINGS—LB & CA

Narzizi Constr. Co., 822 Portage Trail, Akron; O. CA $450,000. CHURCH and SCHOOL, AKRON, O. Arlington Street Baptist Church, E. Market St., Akron, O.

▲ **Ferro Concrete Constr. Co.**, Sixth and Main Sts., Cincinnati, O. CA Est. $2,500,000. 4 story, bsmnt., brick, rein.-con. OFFICE, Broadway and McAllister Sts., CINCINNATI, O. Western & Southern Life Insurance Co., Fourth St., Cincinnati, O. Awarded Apr. 2. CD 3/18.

▲ **Knowlton Constr. Co.**, Bellefontaine, O. LB $1,804,000. (5 bidders) HIGH SCHOOL, CINCINNATI, O. Princeton School Dist., Cincinnati, O.

John Lampe, 879 Neeb Rd. Cincinnati, O., Own Forces $585,000. 39 HOMES on new street off Neeb and Rapid Run Rds., CINCINNATI, O. CD 3/6.

▲ **Tishman Realty & Constr. Co., Inc.**, 460 Park Ave., New York, N. Y. Own Forces. $10,000,000. 20 story, 400,000 sq. ft. aluminum and glass OFFICE BLDG. with PARKING GARAGE, East 9, Superior and Walnut Sts., CLEVELAND, O. Emery Roth & Sons, 575 Madison Ave., New York, N. Y., archts.

Mainline Constr. Co., 8600 Brookpart Rd., Cleveland 29, O. CA $150,000. 24,000 sq. ft. brick, steel STORAGE, CLEVELAND, O. National Malleable & Steel Castings Co., 10600 Quincy Ave., Cleveland 6, O. Howard B. Cain, Park Bldg., Cleveland 14, O., archt.

D. W. Rankin Co., 1836 Euclid Ave., Cleveland 15, O. CA $203,000. 1 story, 18,000 sq. ft., brick, steel FACTORY addn., CLEVELAND, O. Lucas Machine Div., New Britain Machine Co., 12302 Kirby Ave., Cleveland, O. H. M. Morse & Co., 3334 Prospect Ave., Cleveland 15, O., archts. Awarded Mar. 14.

Industrial Constr. Co., Inc., 10101 Meech Ave., Cleveland 5, O. CA $160,000. 120x180 ft. steel WAREHOUSE, CLEVELAND, O. Continental Transportation Co., 12000 Harvard Ave., Cleveland 5, O. Arnold A. Peterson, 3134 Euclid Ave., Cleveland 15, O. archt.

Roy C. Clark, Inc., 804 E. Chicago Ave., East Chicago Ind., CA $300,000, 1 story, no bsmnt., OFFICE BLDG. LOCKER and STOREROOM BLDG., Dickey Rd., EAST CHICAGO, IND. Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown, O. Hutton & Hutton, 5265 Hohman Ave., Hammond, Ind., archts.

Procon, Inc., 1111 Mt. Prospect Rd., Des Palines, Ill. CA $300,000. REFINERY addn., crude oil process unit and pump house, Cline Ave., EAST CHICAGO, IND. Cities Service Oil Co., Bartlesville, Okla. CD 3/1

▲ **S. N. Nielsen Co.**, 3059 W. Augusta Blvd., Chicago, Ill., CA Total est. $40,000,000. 2-unit ELECTRIC GENERATING PLANT, Buffington Harbor, EAST CHICAGO, IND. Northern Indiana Public Service Co., 5265 Hohman Ave., Hammond, Ind. CD 10/1.

† **Pathman Constr. Co.**, 1735 W. Fullerton Ave. Chicago, Ill., CA $578,977. 36-units family HOUSING, C-8-C-61, C-72, Chicago Defense Area, ENG-11-032-57-8 ILLINOIS, U. S. Eng., 475 Merchandise Mart, Chicago, 54, Ill. Bids Mar. 19 awarded Apr. 2. CD 4/1 under LB

Henry Bros. Co., 9112 S. Ashland Ave., Chicago, Ill. CA $360,000. 1 story, brick Catholic CHURCH, 33rd Byron St., CHICAGO, ILL. Catholic Bishop of Chicago, 719 N. Wabash Ave., Chicago, Ill. Pirola & Erbach, 221 N. La Salle St., Chicago, Ill., archts.

C. R. Jernberg & Assocs., 342 S. Michigan Ave., Chicago Ill. CA $150,000, 1 story, 15,000 sq. ft. brick FACTORY and OFFICE, 800 S. Jefferson St., CHICAGO, ILL. Baker Reproduction Co., 208 S. Jefferson St., Chicago, Ill. Robert McCracken, 520 N. Michigan Ave., Chicago, Ill., archt. CD 3/14.

▲ **Sumner Sollitt Co.**, 307 N. Michigan Ave., Chicago Ill., CA $2,187,000. 13 story, brick APARTMENT, 2822 S. Calumet St., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago, Ill. Nicol & Nicol, 23 E. Jackson Blvd., Chicago, Ill., archts. CD 8/9/54.

▲ **L. J. Graf Constr. Co.**, 6327 N. Pulaski Rd., Chicago Ill., CA $1,000,000, 80,000 sq. ft. STORAGE BLDG. and OFFICE, Harrison St., Ridge Rd., Central St. and Crawford Ave., EVANSTON, ILL. Row-Peterson & Co., 1911 Ridge Ave., Evanston, Ill. Perkins & Will, 30 W. Jackson Blvd., Chicago, Ill., archts.

Geo. D. Hardin Co., 2130 S. Michigan Ave., Chicago Ill. LB $137,297. sanitary sewers, lift station force main, Northfield Twp., GLENVIEW, ILL. Northfield Wood Sanitary Dist., 1531 Maple St., Glenview Ill. Baxter Woodman, 68 N. Williams St., Crystal Lake, Ill., engrs.

▲ **Dahl Stedman Co.**, 7 S. Dearborn St., Chicago, Ill. LB $2,410,347; brick HOSPITAL addn., HARVEY, ILL. Ingalls Memorial Hospital, 155th St., Harvey, Ill. CD 3/4.

▲ **Hatlen Constr. Co.**, 1700 W. Bonita St., Mount Prospect, Ill. Owner Builds. $5,000,000. 300 HOMES 122 acre site, west of Mt. Prospect-Hatlen Heights Estates, southwest corner Lincoln and Busse Rds., MOUNT PROSPECT, ILL.

Haglund & Ames, Inc., 123 Greenwood Ave Waukegan, Ill. CA $665,000. 3rd floor LABORATORY and OFFICE addn., 2 story SINTERING BLDG., NORTH CHICAGO, ILL. Fansteel Metallurgical Corp., 2200 N. Sheridan Rd., North Chicago, Ill. Bids Mar. 23. CD 3/22

Elliott Co., Plymouth Bldg., Minneapolis, Minn., CA $509,750. TURBINE GENERATOR for municipal Power Plant, PERU, ILL. City, Peru, Ill. Bids Apr. 1 CD 3/7;
Erie City Iron Wks., 1800 Plymouth Ave., Minneapolis Minn., CA $398,000, furnishing, installing STEAM GENERATING UNIT and TURBINE GENERATING UNIT at municipal power plant (Peru, Ill.).

▲ **L. G. Arnold, Inc.**, P.O. Box 228, Eau Claire, Wis. CA $1,513,612 general contract HIGH SCHOOL RHINELANDER, WIS. Bd. Educ., Rhinelander, Wis. Bids Mar. 26. CD 3/19.

T. S. Willis, 20 E. Milwaukee St., Janesville, Wis. CA Est. $430,000, CHURCH, RECTORY and PARISH HALL WHITEWATER, WIS. St. Patricks Catholic Congregation, Whitewater, Wis. Bids Mar. 11. CD 2/28.

▲ **G. W. Lathrop & Sons, Inc.**, 1510 Montcalm St., Toledo, O. LB $2,214,412. general contr. HIGH SCHOOL, ADRIAN, MICH. City, Bd. Educ., Adrian Mich. Bids Mar. 28. CD 2/18;
C. L. Mahoney Co., Kalamazoo, Mich. LB $914,000, mechanical work (Adrian, Mich.).

General Electric Co., River Rd., Schenectady, N. Y. CA $111,280. TURBINE GENERATOR, Newberry State Hospital, NEWBERRY MICH. State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. E. R. Little Associates, 1806 Kales Bldg., Detroit, Mich., engrs. CD 2/6/53.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Nebraska—RURAL DISTRIBUTION LINES—BA 4/25—Southern Nebraska Rural Public Power Dist., Grand Island, 73 mi. rural distr. lines, 81.9 mi. line changes, 0.9 mi. of removal, Merrick and Hall Counties, $125,000; 11.9 mi. transmission lines, two substations, Merrick, Hall and Hamilton Counties, $75,000. Raymond H. Reed & Co., Columbus, engrs.

† **Neb., Lincoln**—FLIGHT SIMULATOR TRAINING BLDG. —BA 4/25—U. S. Eng., 1709 Jackson St., Omaha, Neb., flight simulator training bldg., Lincoln Air Force Base, ENG-25-066-57-75. CD 8/23.

Continued on page 144

Three Rust-Oleum DIFFERENCES that save you time, money and metal!

GOES ON FASTER

No tedious surface preparations usually required — just scrape and wirebrush to remove rust scale and loose rust — then brush Rust-Oleum 769 Damp-Proof Red Primer right over the remaining rust.

STOPS RUST

Rust-Oleum's *specially-processed* fish oil vehicle works down through the rust into the tiny, microscopic pits in the bare metal where it drives out air and moisture to *stop rust.*

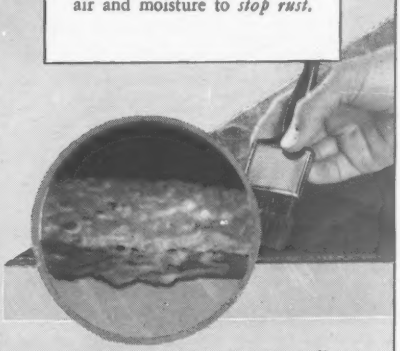
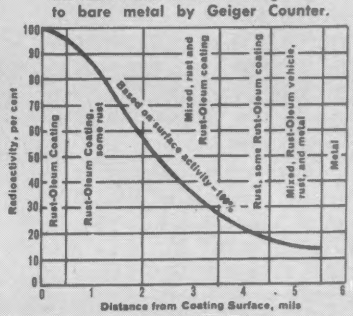
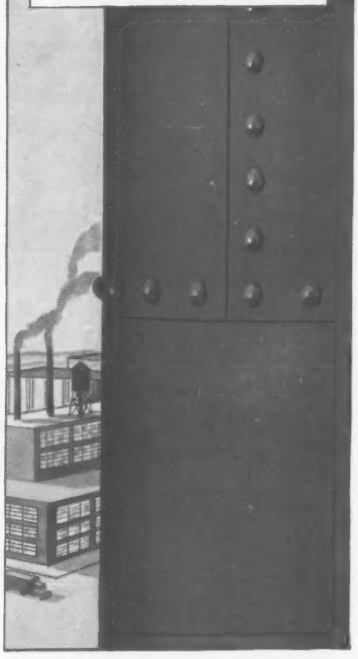


Chart shows results of tracing radio-activated Rust-Oleum through rust to bare metal by Geiger Counter.



LASTS LONGER

Applied over rust, Rust-Oleum lasts longer for the *over-the-years protection* you need. It resists sun, salt water, salt air, fumes, heat, humidity, moisture, weathering.



These are just a few of many important *differences* that separate Rust-Oleum from ordinary coatings. When you consider that Rust-Oleum covers approximately *30% more area,* depending upon surface condition and porosity . . . and the fact that Rust-Oleum finish coatings, with the same fish oil vehicle, are available in nearly every color for *double protection* . . . it's just good, common sense to use Rust-Oleum. Prompt delivery from Industrial Distributor stocks. Write for illustrated literature with color charts.

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HOW TO HANDLE
WET JOBS

#37 of a Series

ONE LIFT REMOVES
18 FT OF WATER FROM
"PATCH-QUILT" SOIL

**Sewage treatment plant, Clayton, N. J.
Contractor: C & T Affiliates, Inc.**

SOIL on this job varied by area—fine silty sand here—coarse sand there—gravel a few feet away. This "patch-quilt" pattern precluded routine handling.

GRIFFIN engineers carefully planned proper installation for each wellpoint, using sand filters on some but not others.

This plus other special methods lowered the 18 ft of water with a money-saving single-stage wellpoint system. Top photo shows system placed directly at water level.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

(Continued from page 142)

MISSOURI—BA 4/26—State Hy. Dpt., Jefferson City,
Bates Co.—bridge pier repairs over Marias des Cygnes Bridge.
one 20 ft. rein.-con. slab span widening, Sta. 297 plus 60.
one 30 ft. rein.-con. slab span wid'n., Sta. 215 plus 97.
two 10 ft. rein.-con. slab spans, Sta. 157 plus 00.
two 10 ft. rein.-con. slab spans, Sta. 272 plus 77.
two 30 ft. rein.-deck girder spans, wid'n. one 60 ft. I beam span (new) sta. 65 plus 57.
three 10 ft. rein.-con. slab spans, Sta. 57 plus 93.
Benton Co.—two 12 ft. rein.-con. slab spans, Sta. 28 plus 66.
Chariton Co.—two 11 ft. rein.-con. slab spans, Sta. 476 plus 62.
two 12 ft. rein.-con. slab spans, Sta. 430 plus 07.
Clay Co.—two 37 ft., two 52 ft. continuous I-beam spans, Sta. 44 plus 93.
one 65 ft., one 50 ft., two 80 ft. continuous I-beam spans, Sta. 18 plus 77.
two 68 ft., one 46 ft., one 56 ft. continuous I-beam spans, Sta. 16 plus 30.
(two 50 ft., two 75 ft. continuous) one 41 ft. I-beam spans, Sta. 995 plus 12.
culvert at Sta. 974 plus 915 ft., 415 ft. semi-elliptical arch.
two 37 ft., two 52 ft. continuous I-beam spans, Sta 44 plus 93.
Henry Co.—two 10 ft. rein.-con. slab spans, Sta. 244 plus 17.
two 10 ft. rein.-con. slab spans, Sta. 30 plus 54.
Iron Co.—three 10 ft. concrete culverts Sta. 23 plus 46.
two 10 ft. rein.-con. culvert Sta. 286 plus 56.
three 11 ft. rein.-con. slab spans, Sta. 303 plus 77.
Lafayette Co.—two 12 ft. rein.-con. slab spans, Sta. 690 plus 57.
Oregon Co.—one 49 ft., I-beam span, one 120 ft. steel truss span two 65 ft. continuous I-beam spans, Sta. 432 plus 60.
Platte Co.—two 35 ft., two 56 ft., two 70 ft., one 47 ft. I-beam spans, Sta. 931 plus 30.
two 60 ft., one 72 ft. I-beam spans, Sta. 942 plus 53.
two 45 ft., one 25 ft., rein.-con. deck girder spans, Sta. 952 plus 23. Rex Whitton, ch. engr.

MISSOURI—BA 4/26—State Hy. Dpt., Jefferson City,
Audrain Co.—graded earth, surf. 4.974 mi.
Barton Co.—graded earth, surf. 1.016 mi.
Bates Co.—graded earth, surf. 3.216 mi.
graded earth, surf. 1.951 mi.
graded earth, surf. 1.006 mi.
graded earth, surf. 3.125 mi.
graded earth, surf. 0.152 mi.
graded earth, wid'n., b. conc. 0.786 mi.
Benton Co.—graded earth, surf. 5.967 mi.
Boone Co.—material surf. 1.037 mi.
graded earth, surf. 6.577 mi.
Calloway Co.—graded earth, surf. 7.873 mi.
Cass Co.—graded earth, surf. 2.73 mi.
Chariton Co.—graded earth, surf.
Clay Co.—graded earth, two 24 ft. c. conc. 0.521 mi.
graded earth, two 24 ft. c. conc. 0.958 mi.
Dade Co.—graded earth, surf. 3.024 mi.
Douglas Co.—graded earth, surf. 2.485 mi.
graded earth, surf. 5.224 mi.
Henry Co.—graded earth, surf. 3.63 mi.
graded earth, surf. 4.694 mi.
Iron Co.—graded earth, surf. 8.837 mi.
Lafayette Co.—graded earth, surf. 3.088 mi.
graded earth, surf. 4.817 mi.
Lincoln Co.—graded earth, surf. 8.895 mi.
Mercer Co.—graded earth, oiled earth surf. 7.833 mi.
Morgan Co.—graded earth, surf. 3.188 mi.
Nodaway Co.—graded earth, surf. 1.993 mi.
Oregon Co.—graded earth, surf. 0.42 mi.
Ozark Co.—graded earth, surf. 5.067 mi.
Pettis Co.—graded earth, surf. 2.382 mi.
Platte Co.—graded earth, two 24 ft. c. conc. 1.041 mi.
Putnam Co.—graded earth, surf. 7.703 mi.
Reynolds Co.—graded earth, surf. 1.777 mi.
St. Louis Co.—lighting mercury vapor lights.
Saline Co.—graded earth, surf. 2.383 mi.
Sullivan Co.—graded earth, surf. 1.282 mi.
graded earth, surf. 0.589 mi.
St. Louis City—traffic signals at veterans bridge approx. on Mark Twain Expressway, Rex Whitton, ch. engr.

† **Mont., Lame Deer and Busby**—BA 4/26—Bureau Indian Affairs, Dpt. Interior, Box 1777, Albuquerque, imprv. sewerage sys. BU 257-392.

† **Tex., Fort Hood**—SERVICE CLUB—BA 4/26—U. S. Eng., 100 W. Vickery Blvd., Fort Worth, E. M. Service Club, Inv. No. ENG 41-443-57-17. Extended date. John Linn Scott & Marvin C. Turner, 306 W. 17th St., Austin, archts.-engrs. CD 3/26.

† **Tex., San Antonio**—AIR FORCE BASE—BA 4/26—U. S. Eng., Box 1229, Galveston, constr. Communications General Bldg. No. 1A, Brooks Air Force Base, ENG-41-243-57-19. $100,000. Extended date. CD 3/21.

† **Minn., New London**—BA 4/29—Fish & Wildlife Service Dpt. Interior, 1006 W. Lake St., Minneapolis, water supply sys., U. S. Fish Cultural Station, FW3-2897.

Minn., Falcon Heights (P.O. St. Paul)—BA 4/30—Village, C. J. Stewart, clk., 1432 California Ave., W., sanitary sewer Imprv. No. 1 Part I, $510,600. Plans deposit $20, Toltz, King, Duvall, Anderson & Assocs., 1509 Pioneer Bldg., St. Paul, engrs. CD 12/27.

† **S. D., Rapid City**—NIKE FACILITIES—BA 5/1—U. S. Eng., 1709 Jackson St., Omaha, Neb., NIKE facilities, Stage II, West Side, Ellsworth Air Force Base, ENG-25-066-57-66.

Tex., Fort Worth—BA 5/2—City, City Hall, constr. Proj. 86W-6P, Contr. No. 11, consisting 6,361 lin. ft. 60 in. concrete pressure line together with valves, venturi meter etc. $280,000. Plans deposit $25. Freese & Nichols, 407 Danciger Bldg., Fort Worth, Tex., consult. engrs. CD 3/1/54.

† **South Dakota**—BA 5/2—U. S. Eng., 1709 Jackson St., Omaha, Neb., constr. approach fill at C.M. St. Paul & Pacific R.R. Co. Missouri River bridge, near Mobridge, Inv. 25-066-57-92.

† **Minn., Duluth**—HEATING PLANT—BA About 5/8—U. S. Eng., 1217 U. S. Post Office & Custom House St. Paul, Zone 1, central heating plant addns., Duluth Air Force Base, ENG-21-018-57-15. CD 8/23.

† **Colorado**—BA 5/9—Bureau Reclamation, Dpt. Interior Loveland, Big Thompson Power-plant and switchyard Colorado-Big Thompson Project, Spec. DC-4890, adv. ENR 4/18.

† **Missouri**—BA 5/9—U. S. Eng., P.O. Box 97 Memphis 1, Tenn., levee repairs, embankment Levee Item No. R-48. 5R A.C., Cape Girardeau, approx. levee stations 4 plus 40- 6 plus 0, and 8 plus 29-14 plus 2, along Little River headwater Diversion Levee in Cape Girardeau Co., CIVENG 40-041-57-173. CD 11/7/55.

† **N. M., Roswell**—DORMITORY—BA About 5/14—U. S. Eng., P.O. Box 1538, Albuquerque, two 3 story airmen's dormitories, Walker Air Force Base, ENG-29-005-57-90. CD 10/20/55.

† **Mont., Glasgow**—HOUSING—BA 5/23— U. S. Eng., City-County Airport, Walla Walla, Wash., family housing at Glasgow Air Force Base, ENG-45-164-57-40. Plans deposit $100. CD 4/27/55.

BUILDINGS—BA

▲ **Mo., St. Louis**—LIBRARY—BA On Or About 4/23—St. Louis University, Very Rev. Paul C. Reinert, S.J., pres., 221 N. Grand Blvd., 5 story, bsmnt., 190x220 ft., brick, steel, concrete, glass Pope Pius XII Memorial Library, Lindell Blvd. between Grand Blvd. and Spring Ave. $4,000,000. Leo A. Daly Co., Ambassador Bldg., 411 N. Seventh St., Zone 1, archt.-engr. Alfred Morten Githens, 633 N. Columbus Ave., Mount Vernon, N. Y., architectural consulant. CD 2/19/54.

Minn., Aurora—ADMINISTRATION—BA 4/25—Erie Mining Co., 700 Sellwood Bldg., Duluth (selected list bidders), 2 story, part 3rd floor, 130x170 ft. administration bldg. and gatehouse, $800,000. H. R. Starin & Assoc., Inc., 317 Sellwood Bldg., Duluth, archt.

Mont., Broadus—SCHOOL—BA 4/26—Powder River County High School Dist., 1 story, 28,000 sq. ft. high school, $400,000. Plans deposit $35. Drake & Gustafson, Empire Bldg., Billings, archts. CD 11/28.

▲ **Colo., Pueblo**—SCHOOLS—BA 5/1—Bd. Educ., School Dist. No. 60, 102 W. Orman Ave., 1 story, 168,000 sq. ft. Northeast High School. $1,500,000. Walter DeMourdaunt, 738 Thatcher Bldg., Pueblo, engr. CD 4/9/56.

Mo., Vandalia—SCHOOL—BA 5/1—School Dist. R-1, Audrain Co., Bd. Educ., Margaret Janes, secy., high school, 1 mi. west of city limits, $750,000. Abt & Cleavinger, 1 Holman Rd., Moberly, archts. CD 6/13.

Ark., Pine Bluff—WAREHOUSE—BA 5/1—Staples Realty Co., Charleston, Mo., constr. warehouse to contain 8,000 sq. ft. floor space, concrete builtup slab walls to be erected on tract bounded by 4th and 5th Aves. and Bois D'Arc and Peach Sts., $100,000-$150,000. Extended date. Sears, Roebuck & Co., Chicago, Ill. and 303 Main St., Pine Bluff, lessee. Jack Harris 518 Hickman Bldg., 248 Madison Ave., Memphis, Tenn., archt. CD 3/25.

▲ **Tex., Longview**—HOSPITAL—BA 5/13—Gregg Co., c/o Jno. L. Allen, Comnr., Courthouse, Gregg Memorial Hospital addn., alterations, $1,000,000. Wilson, Morris & Crain, 3330 Graustark and Rather & Howze 2814 Virginia St., Houston, archts. Walter P. Moore 2 Pinedale, and H. E. Bovay, Jr., 5009 Carolina St., Houston, engrs. CD 3/25.

▲† **Kan., Kansas City**—POST OFFICE—BA 5/15—U. S. Post Office Dpt., Thomas G. Jay, regional R.E. mgr., Bureau Facilities, Post Office, Wichita, post office, $1,500,000. CD 1/23, under LB, Commercial Buildings.

† **Mont., Great Falls**—ARMY RESERVE, etc.—BA 5/16—U. S. Eng., City-County Airport, Walla Walla, Wash., 1 story, 11,000 sq. ft. structural steel army reserve bldg., 2,500 sq .ft. motor vehicle storage shed, ENG-45-164-57-41. Plans deposit $100.

▲ **Tex., Houston**—PLANT—Bids asked—St. Joe Paper Co., Barnett Bldg., Jacksonville, Fla., design and construct container plant.

BUILDINGS—SLC

Tex., Corpus Christi—WORK SHOP—Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, soon lets contract work shop center, $100,000. Charles G. Tarbell, c/o owner, engr.

HEAVY CONSTRUCTION—LB & CA

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,
Hallett Constr. Co., Crosby, Minn. CA **$893,227.** c. conc. 11.5 mi. between Hawley and 1 mi. east of Lake Park, Clay and Becker Counties. CD 3/27, under LB.

(Continued on page 148)

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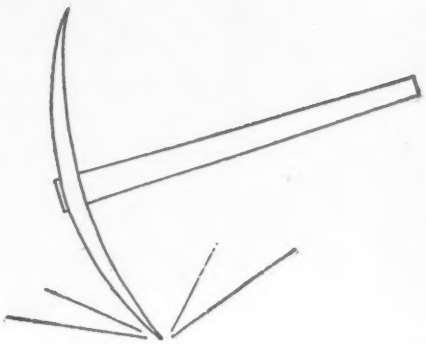

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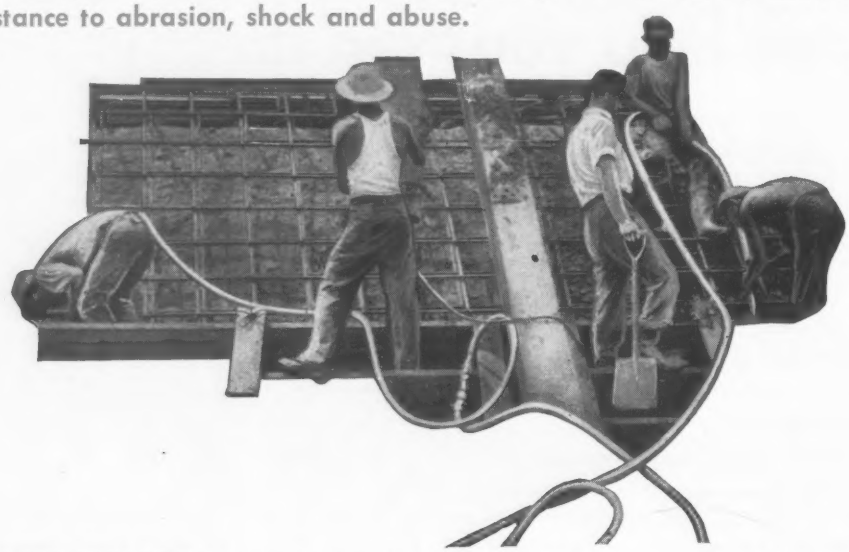

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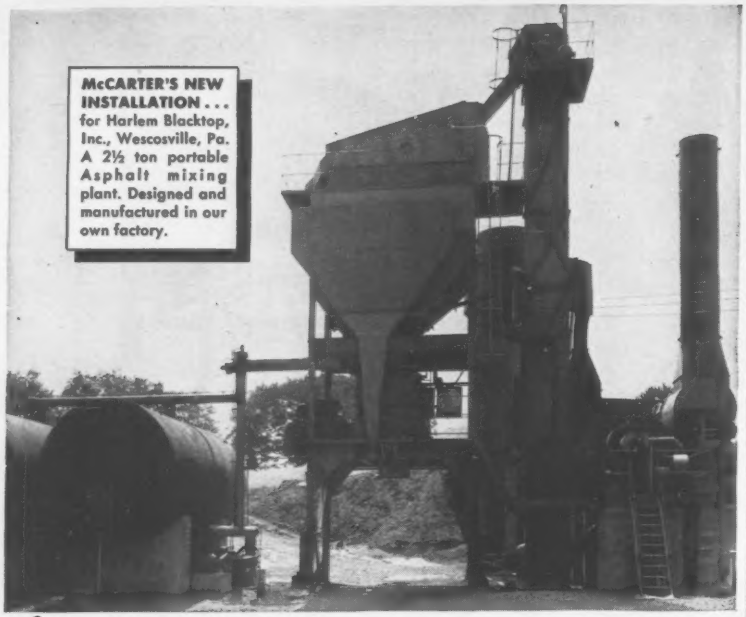
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Dur-O-wal Div., Cedar Rapids Block Co., CEDAR RAPIDS, IA. Dur-O-wal Prod., Inc., Box 628, SYRACUSE, N.Y. Dur-O-wal of Ill., 119 N. River St., AURORA, ILL. Dur-O-wal Prod. of Ala., Inc., Box 5446, BIRMINGHAM, ALA. Dur-O-wal Prod., Inc., 4500 E. Lombard St., BALTIMORE, MD. Dur-O-wal Div., Frontier Mfg. Co., Box 49, PHOENIX, ARIZ. Dur-O-wal, Inc., 165 Utah St., TOLEDO, OHIO

(Continued from page 144)

▲† **Farnsworth & Chambers, Inc.,** Box 74, Houston 1, Tex., CA $4,710,596. Schedule 1. addnl. bldgs. t School of Medicine, Brooks Air Force Base, ENG-4 243-57-30, SAN ANTONIO, TEX. U. S. Eng., B 1229, Galveston, Tex. Bids Mar. 27, CD 4/3, under L

BUILDINGS—LB & CA

▲ **M. A. Mortenson Constr. Co.,** Sexton Bldg., M neapolis, Minn. CA $1,000,000. general cons 1 story, 182x286 ft. COMPUTER BLDG., LAUDE DALE, MINN. Northern States Power Co., 15 Fifth St., Minneapolis, Minn. Bids Mar. 2 CD 3/7.

▲ **Johnson, Drake & Piper,** Baker Bldg., Minneapol Minn. CA $1,600,000. general constr. 4 sto HOSPITAL addn. and remodel KITCHEN a LAUNDRY, MINNEAPOLIS, MINN. Abbott Hospita F. Briggs, admin., 110 E. 18 St., Minneapol Minn. CD 12/19.

▲ **O. A. Stocke Co., Inc.,** 115 S. 3 St., Rochester, Min CA $1,124,000. (4 bidders) general constr., 3 sto 150x289 ft. COURT HOUSE, ROCHESTER, MIN Olmsted Co., Frances L. Underleak, aud., Rochest Minn. (Correction-cost). CD 4/4, under CA.

L. J. McNeary, 9715 Gravois Rd., Affton 23, Mo. Own Builds. $650,000. 75 RESIDENCES in Tara Plot N 4 subdivision north of Tara Plot No. 2 adjacent Lavina Dr. and Baptist Church Lane, AFFTON (S LOUIS 23 P. O.), MO.

▲ **L. J. McNeary,** 9713 Gravois Rd., Affton 23, Mo Owner Builds. $1,000,000. 160 RESIDENCES in Tar South Subdivision adjacent to Telegraph Rd. and Lin bergh Blvd., St. Louis County, MEHLVILLE (ST. LOUI 23 P. O.), MO.

▲ **Southwestern Bell Telephone Co.,** 308 S. Akard St Dallas, cancelled bids to have been opened Jan. 1 foundation and preparation for constr. 8 story offic bldg., Houston St. between 10th and 11th Sts., FOR WORTH, TEX. Est. $5,700,000. Will re-advert CD 1/16.

▲ **G. Sargl,** Kyle Bldg., Beaumont, Tex. CA $1,029, 000. masonry type DIAL TELEPHONE EXCHANGE BLDG., BEAUMONT, TEX. Southwestern Bell Tele phone Co., 308 S. Akard St., Dallas, Tex. and c/o S. C. Falk, owners' mgr., Beaumont, Tex. CD 7/11.

Temple Assocs., Box 309, Diboll, Tex., CA $570,567. HOSPITAL EXPANSION, LUFKIN, TEX. Lufkin Memorial Hospital, c/o E. L. Kurth, Lufkin, Tex. Bids Mar. 27, CD 4/4, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

Calif., Los Angeles—BA 4/26—Bd. Supervs., Los Angeles Co., 501 Hall of Records, imprv. Mansel Ave., Rosecrans Ave. to Compton Blvd., and Kingsdale Ave. to Hawthorne Blvd., CI 1653, $154,580. CD 3/6.

▲† **Calif., Sacramento**—DORMITORIES, etc.—BA 4/30 —U. S. Eng., 1209 8th St., Airmen Dormitories No. 4 and No. 7, Dining Hall No. 1, paving and utilities at Mather Air Force Base, Spec. Nos. 2093, 2094 and 2207, ENG-04-167-57-50. $1,500,000. CD 11/16.

▲† **California**—BA 5/1—U. S. Eng., 751 S. Figueroa St., Los Angeles, dredging Mission Bay Quivera Basin and Main Channel, San Diego River, ENG-04-353-57-39. $1,500,000. CD 4/25/44.

▲ **Washington**—5/3—Pub. Utility Dist. No. 1, Cowlitz Co., 1421 14 Ave., Longview, power house, power canal, and associated structures, Lewis River, Skamania and Cowlitz Counties, for Swift Hydro-Electric Project No. 2., incl. 3.5 mi. power canal, waste and check structures, discharge channel in Lewis River, road relocation, 60x144 ft. rein.-con. structural steel power house, concrete tailrace lining, governor bridge crane, two 46,000 hp. turbines, two 38,889 kva. generators, two fixed wheel intake gates, two transformers, isolated phase bus, electrical equipment, grounding sys., conduit and cable, lighting and power house equipment. Bechtel Corp., 612 S. Flower St., Los Angeles, Calif., consult. engr., ENR 4/18. CD 10/25.

† **Wash., Fort Lewis**—COMMUNICATIONS CONDUIT—BA 5/3—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, construct 10,000 ft. communications conduit, second increment, ENG-45-108-57-130. CD 3/5, under LB.

† **Washington**—BA 5/7—Bureau Reclamation, Dpt. Interior, Ephrata, constr. earthwork and structures for deep drains, DPE216.3 system and DPE221A, Block 49, Columbia Basin Proj., Spec. 117C-427. CD 9/10.

† **Washington**—BA 5/9—U. S. Eng., City-County Airport, Walla Walla, 500 ton bridge crane for Ice Harbor Dam powerhouse, Pasco, Inv. 57-67. Extended date. CD 3/15.

† **Washington**—GENERATOR BLDGS.—BA 5/14—U. S. Eng., City-County Airport, Walla Walla, addns. to generator bldgs., installation of generator fueling systems, etc., for Nike facilities, ENG-45-164-57-39.

BUILDINGS—BA

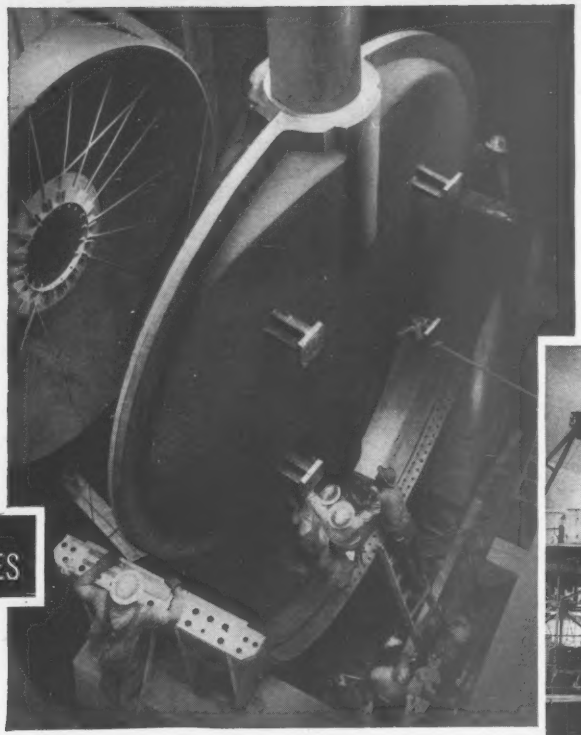
▲ **Calif., Los Angeles**—SCHOOL—BA 4/26—Los Angeles Bd. Educ., 1425 S. San Pedro St., Monroe High School, (formerly North West Valley). $3,500,000. CD 2/28/55.

† **Ariz., Holbrook**—DORMITORY FACILITIES—BA 4/30 —Bureau Indian Affairs, P. O. Box 177, Albuquerque, N. M., permanent dormitory facilities, Proj. No. BU 603-352(h).

† **Ariz., Ganado**—QUARTERS—BA 5/1—Bureau Indian Affairs, P. O. Box 1777, Albuquerque, N. M., 1 story, concrete block quarters bldg., Proj. No. BU 603-165.

▲ **Wash., Spokane**—PLANT—BA 5/1—Inland Empire Dairy Assn., W. 1803 Third St., 2 story, bsmnt.,

(Continued on page 151)



An 18' butterfly valve disc is shown here during installation at Blakely Mountain in Arkansas. Note the streamlining of the welded disc.

Photos—Vicksburg District, Corps of Engineers

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BUTTERFLY VALVES

SMS VALVE SEALS CUT LEAKAGE TO MINIMUM

SMS Butterfly Valve seals cut leakage to a minimum. Disc seals are adjustable from either inside or outside, whichever is specified. Specially-developed SMS trunnion seals are essentially drop-tight.

With inside adjustment, the disc may be seated directly on the plate steel housing, as at Blakely Mountain, illustrated above, and as at Fort Peck, Montana. Here a 16 ft. dia. valve, recently tested after 14 years of service, had *less than ½ gpm leakage.*

SMS welded discs and housings assure greater freedom from the material defects of castings and permit more economical construction. The photo illustrates the streamlining possible with welded steel plate construction. This holds head losses and turbulence to a minimum.

SMS has designed and built butterfly valves in diameters from 3 inches to 18 feet, for service with operating heads up to 750 feet. For the assurance that your hydraulic equipment will meet or exceed specifications, you can rely on over three-quarters of a century of experience that SMS offers. For full information on butterfly valves, hydraulic turbines and accessories, write S. Morgan Smith Company, York, Pennsylvania.

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Greater early strength permits you to pull forms much earlier, switch them to other jobs

COLUMBIA CALCIUM CHLORIDE keeps cool-night jobs moving because it prevents usual lag in ready mix set

You'd counted on a fast concrete set tonight. Then the unstable spring temperature skidded below 70° F. In trouble? Not if your ready mix is treated with Columbia Calcium Chloride! Low temperatures don't cause costly time lags when the mix contains this dependably protective chemical.

Time-tight jobs benefit because Columbia Calcium Chloride's unique action produces both initial and final set *three times faster* than untreated concrete. And this is the average time savings under normal conditions; at *lower* temperatures, the effects become even *more* pronounced.

The quicker early strength of Columbia Calcium Chloride treated concrete slices more time from the job. Check this difference at 40° F, for example . . . treated concrete's one-day strength matches the level reached by untreated concrete after two days; in three and a half days, treated concrete is fully as strong as week-old untreated. There's a striking difference in ultimate strength, too.

Quicker setting, greater strength in half usual times, earlier form removal, and less overtime for finishers . . . hadn't you better analyze your batching procedures or talk to your ready mix supplier about Columbia Calcium Chloride *today?* For more information, contact our nearest district sales office or our Pittsburgh address.

Improved workability and quicker set put finishers to work hours ahead of schedule, saving costly overtime

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IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

(Continued from page 148)

...0,000 sq. ft. dairy products plant with maintenance ...dg. and loading dock. $1,250,000.

HEAVY CONSTRUCTION—LB & CA

WASHINGTON—State Hy. Comn., Olympia, ...sh.—**Scarsella Bros.**, 2207 S. 146 St., Seattle, Wash. LB $413,953. clearing, drainage, grading, rein.-con. flat slab bridges 1.708 mi. Primary State Hy. ...1, Lacey Rd. to Martinwray, FAP No. I-001-2 (43), Thurston Co.

...sh.—**Associated Sand & Gravel Co.**, 2508 Colby St., Everett, Wash. LB $157,999. surf., Type I-1 b. conc. 0.922 mi. Secondary State Hy. 15-B, Haskell Slough and Skykomish River Bridge approaches FAS No. S 0225 (5), Snohomish Co.;

...sh.—**Hegewald Timber Co., Inc.**, Stevenson, Wash. LB $85,201 (2 bidders) stockpiling crushed stone surf. maintenance rock and mineral aggregates on State Hys. 8 and 8-C, Stevenson vicinity, Skamania Co.;

...sh.—**Grant Constr. Co.**, Coeur de'Alene, Idaho. LB $213,219 (7 bidders) light bit. surf. 28.79 mi. feeder roads, Block 18, Franklin Co. Bids Apr. 2. CD 3/18.

CALIFORNIA—State Dpt. P. Wks., 1120 N. St., Sacramento, Bids opened 3/20,

...rman Constr Co., 201 Adams Bldg., Vancouver, Wash. LB $130,005. (7 bidders) excavating trenches and grading, shaping shoulder areas and surfacing 7.7 mi. U. S. 99 between Shasta River and Gazelle, Siskiyou Co. CD 2/26.

CALIFORNIA—State Div. Hy., 1120 N. St., Sacramento, Bids opened 4/3.

...Mercer, Fraser Co., Inc., & Mercer, Fraser Gas Co., Inc., 2nd and Commercial Sts., Eureka, Calif. LB $469,862 (9 bidders) constr. 3 rein.-con. bridges and approaches to 2 bridges to be graded on U. S. 101 between 0.4 mi. north of Fortuna and 0.4 mi. north of Fernbridge, Humboldt Co. CD 3/21.

CALIFORNIA—State Dpt. P. Wks., 1120 N. St., Sacramento, Bids opened 3/20,

...C. Smith Co., 225 19th Ave., San Mateo, Calif., CA $947,105; constr. 1.1 mi. freeway together with frontage roads, ramps and an interchange on Rte. 68, between Stevens Creek and Ellis St., in Mountain View, Santa Clara Co.

CALIFORNIA—State Div. Hy., 1120 N. St., Sacramento, Bids opened 4/3,

...Calif.—**Volpa Bros.**, 233 Nielsen Ave., Fresno, Calif., LB $288,223 (6 bidders) grading, surfacing 2.7 mi. ...Rte. 41 at Blackstone Ave. between Shaw Ave. and 0.8 mi. N of Herndon Ave., Fresno Co.;

...Calif.—**Baun Constr. Co., Inc.**, 3229 W. Dudley Ave., Fresno, Calif. LB $126,512 (6 bidders) surfacing 26.6 mi. hy. at various locations, Fresno and Madera Counties;

Calif.—**Paul E. Woof**, 2203 N. Fruit Ave., Fresno, Calif., LB $185,987 (7 bidders) retaining walls constructed and roadway restored on Sign Rte. 1 between Hot Springs Canyon and Big Sur River, Monterey Co.;

Calif.—**Valley Paving & Constr. Co.**, P. O. Box 6, Pismo Beach, Calif., LB $117,434 (5 bidders) surfacing 30.8 mi. hy. at various locations, Santa Barbara and San Luis Osispo Counties;

Calif.—**John P. Stegge**, 1150 Pt. San Pedro Rd., San Rafael, Calif., LB $158,385 (7 bidders) surfacing 6.7 mi. Weaverville-Minersville Rd. between Browns Mt. and Buckeye Creek Rd., Trinity Co. CD 3/11.

S. J. Amoroso Constr. Co., 2100 Oakdale Ave., San Francisco, Calif., LB $954,856 (7 bidders) constr. toll plaza bldgs., addns., alterations, incl. altering administration and shops bldg., new rein.-con. maintenance bldg. center portion 40x61 ft., two 1 story, 61x120 ft. steel metal frame wings, gas station, etc., San Francisco-Oakland Bay Bridge, City of Oakland, Alameda Co., CALIFORNIA. State Div. Architecture, 1120 N. St., Sacramento, Calif. Bids Apr. 2. CD 3/5.

▲ **Matich Bros. & M. M. Sundt Constr. Co.**, P. O. Box 390, Colton, Calif., LB $1,347,110. (7 bidders) constr. levees downstream from Crestmore Ave. Bridge near Riverside, Santa Ana River Basin, ENG-04-353-57-37, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Apr. 4, CD 3/7.

▲† **R. A. Westbrook, Morrison-Knudsen Co., Inc. & H. Earl Parker, Inc.**, 6431 Elvas Ave., Sacramento, Calif., CA $10,261,686. primary runway (concrete) and related facilities at Beale Air Force Base, near Marysville, to convert it into Strategic Air Command Heavy Bomber Base, ENG-04-167-57-42, BEALE AIR FORCE BASE, CALIF. U. S. Eng., 1209 8th St., Sacramento, Calif., Bids Mar. 21, awarded Mar. 29. CD 4/1, under LB.

† **R. E. Ziebarth & S. B. Alper**, P. O. Box 568, Torrance, Calif., CA $533,333. electrical distr. sys., Naval Amphibious Base, Spec. 7409-56, CORONADO, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids Mar. 21, CD 8/28.

MacIsaac & Menke, 3440 E. 14th St., Los Angeles, Calif., CA $166,100. bldg. enclosure bldg. and dressing room, soon to be constructed pool at DOWNEY, CALIF. Downey Park & Recreation Dpt., 12540 S. Rives Ave., Downey, Calif. Bids Mar. 12.

Tony Crisalli Corp., 10503 6th Ave., Englewood, Calif., LB $863,840. (11 bidders) Joint Outfall Sewer "B", Unit 9B, Section 2, and Unit 9C, Compton, LOS ANGELES, CALIF. Los Angeles County Sanitation Dist. 2, 2020 Beverly Blvd., Los Angeles, Calif. Bids Mar. 27, CD 3/11.

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., LB $231,738, (4 bidders) imprv. Victory Blvd., Sepulveda to Balboa Blvds., LOS ANGELES, CALIF. City Council, City Hall, Los Angeles, Calif. Bids Mar. 27, CD 10/13/55.

Joe D. Miller, 3333 Edison Hy., Bakersfield, Calif., CA $444,021. trunk line, Gerard Ave., MERCED, CALIF. City, City Clerk, City Hall, Merced, Calif. CD 12/31;
Kovick Bros., P. O. Box 1322, Fresno, Calif., CA $166,695, outfall line (Merced, Calif.).

Ransome Co., 4030 Hollis St., Emeryville, Calif., LB $308,086. (4 bidders) street imprvs., Adeline St. between 8th St. and southern line of Emeryville, (sewer lines, manholes, catch basins, curbs, etc.) OAKLAND, CALIF. City, c/o City Clerk, City Hall, Oakland, Calif.

Hutzler Constr. Co., 6510 Outlook Ave., Oakland, Calif., LB $163,983. (4 bidders) 60,000 sq. ft. concrete horse barns, L&V Terminal, Fremont, PLEASANTON, CALIF. Alameda Co., c/o Clerk, Courthouse, Oakland, Calif. Bids Mar. 28, CD 3/13.

P & E Constr. Co., 1620 S. 7th St., San Jose, Calif., LB $252,484 (8 bidders) sanitary trunk and force main sewer, North Side unit A, SANTA CLARA, CALIF. City, City Hall, Santa Clara, Calif. CD 11/20/52.

W. W. Holt Constr. Co., 1122 S. La Cienega Blvd., Los Angeles 36, Calif., CA $135,518. Automobile parking lot on Beach, Bicknell St. to Ashland Ave., SANTA MONICA, CALIF. City Council, City Hall, Santa Monica, Calif. Bids Mar. 20, CD 11/28.

Argonaut Mortgage Co., 128 Post St., San Francisco, Calif. Owner Builds. $101,200. subdivision imprvs. at Londonderry Glen Tract (streets, sewers, water lines, lighting, 92 lots, SUNNYVALE, CALIF. Geoge S. Holte, 3850 Middle Field Rd., Palo Alto, Calif., engr.

▲ **Fred J. Early, Jr., Inc.**, 369 Pine St., San Francisco, Calif., LB $844,774 (7 bidders) sewage treatment plant, 1 mi. south of Ukiah Airport, UKIAH, CALIF. City, City Hall, Ukiah, Calif. CD 21/55;
McGuire & Hester, 796-66th Ave., Oakland, Calif., LB $491,090 (7 bidders) interceptor sewer and trunk sewer (North Interceptor Sewer and Vichy Springs Rd. sewer) (Ukiah, Calif.).

BUILDINGS—LB & CA

▲ **Jordan-Wilcomb Co.**, 406 S. Sixth St., Boise, Idaho. LB $1,477,228 (7 bidders) 3 masonry, 140,-000 sq. ft. bldgs. for Borah HIGH SCHOOL, BOISE, IDAHO. Independent School Dist., 1207 Fort St., Boise, Idaho. Bids Apr. 1. CD 3/19.

▲ **A. Ritchie & Co.**, Walla Walla, Wash. LB $2,094,-361, est. $2,000,000. SENIOR HIGH SCHOOL, PENDLETON, ORE. School Dist. No. 16-C, Pendleton, Ore. Bids Apr. 2. CD 3/15.

▲ **Paul B. Emerick**, 4540 S.E. 174 Ave., Portland, Ore. CA $1,697,900. general constr. Waldo and Judson JUNIOR HIGH SCHOOLS, SALEM, ORE. School Dist., 1309 Ferry St., Salem, Ore. Bids Mar. 22, awarded Mar. 28. CD 3/29, under LB.

† **Claremont Contractors**, 911 E. Foothill Blvd., Claremont, Calif., LB $176,440. (4 bidders) consolidated shipping and receiving facilities, Marine Corps Supply Center, Spec. 5503-56, BARSTOW, CALIF. Eleventh Naval Dist., 1200 Pacific Hy., San Diego, Calif. Bids Mar. 28, CD 8/27.

Cory & Longworth, 1975 5th Ave., San Diego, Calif., LB $732,600. (3 bidders) CARLSBAD HIGH SCHOOL, CARLSBAD, CALIF. Carlsbad-Oceanside Union High School Dist., 801 Pine Ave., Carlsbad, Calif., Kistner, Curtis & Foster, Spreckles Bldg., San Diego, Calif., archts. Bids Mar. 26, CD 1/20.

▲† **Harold C. Geyer**, P. O. Box 1190, Monterey, Calif., CA $1,146,054. 4 rein.-con. masonry, 24,150 sq. ft. buildings, incl. POST CHAPEL with EDUCATIONAL FACILITIES, 10,000 sq. ft. REGIMENTAL CHAPEL, 15,000 sq. ft. THEATER, 4,000 sq. ft. BRANCH POST EXCHANGE, ENG-04-203-57-123, FORT ORD, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif., bids Mar. 14, CD 3/20, under LB.

▲ **Pacific Coast Builders**, No. 1 S. Park St., San Francisco, Calif., LB $2,429,000 (2 bidders) rein.-con., frame TENNYSON HIGH SCHOOL, incl. 40 classrooms, gymnasium, HAYWARD, CALIF. Hayward Union High School Dist., c/o Supt., 22300 Foothill Blvd., Hayward, Calif. Bids Apr. 3. CD 3/19.

▲ **Steed Bros.**, 714 Date Ave., Alhambra, Calif., LB $2,773,000 (8 bidders) SCIENCE BLDG. at Los Angeles College of Applied Arts and Sciences, San Bernardino Campus, LOS ANGELES, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids Apr. 3. CD 2/26.

▲ **Frank Tsunoda**, 395 Ortega Ave., Mountain View, Calif. Owner Builds. $5,000,000. 520 unit garden APARTMENT PROJ., 20 acre site, MOUNTAIN VIEW, CALIF.

Hilp & Rhodes, 918 Harrison St., San Francisco, Calif., CA $190,000. WAREHOUSE, Army St., near Kansas St., SAN FRANCISCO, CALIF. Haas Bros., 3rd and Channel Sts., San Francisco, Calif.

Carl N. Sevenson Co., Inc., 1095 Stockton Ave., Stockton, Calif., CA $729,170 (8 bidders) 3 story, 63,-000 sq. ft. DEPARTMENT STORE, Sunnyvale Plaza Shopping Center, SUNNYVALE, CALIF. Harts' Dept. Store, Market and Santa Clara Sts., San Jose, Calif., Bids Mar. 29. CD 3/25.

CANADA

BUILDINGS—BA

Que., Normandin—SCHOOL, etc.—BA 4/24—LaCommission Scolaire Canton Normandin, school and residence. $750,000. Maurice Mainguy, 565 Rue St. Jean St., Quebec City, archt. Fortin & Gilbert, 919 rue Madeleine de Vercheres, Quebec City, engrs.

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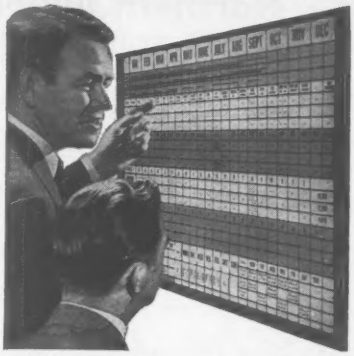

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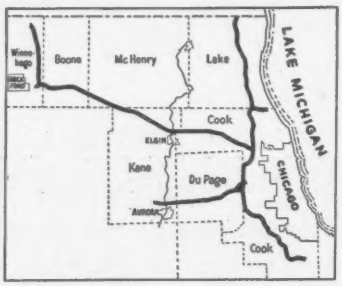
CONTRACT N-8A

The work to be done under this contract shall be commenced on June 30, 1957, or on such earlier date as may be mutually agreed upon between The Commission and The Contractor. All work under this contract shall be completed on or before December 15, 1958, and consists of: The grading, drainage, paving, seeding, the construction of appurtenances, and the erection of concrete bridges for approximately 2.074 miles of The Tri-State Route; approximately 1.285 miles of the North Illinois Rate; and approximately 4.311 miles of interchange connectors all in Construction Section N-8A; the Tri-State Route beginning in Leyden Township at the crossing of the MSP&SSM Railroad at Tri-State Highway centerline Station 2272+18.82 (at the back of the abutment) and extending northerly to a point about 1300 feet north of Devon Ave. at Station 2381+69.49 in Maine Twp.; the North Illinois Route beginning in Leyden Township at a point about 850 feet southeast of Higgins Road at Northern Illinois Toll Highway centerline Station 3273+40 and extending southeasterly to a point about 1500 feet west of East River Road at Station 3341+25.72, all in Leyden and Maine Twps., Cook Co., Ill.

The approximate quantities of the principal items of work are as follows:

Roadway Excavation, Unclassified	98,000 C.Y.
Borrow	2,160,000 C.Y.
Selected Subgrade	103,000 C.Y.
Granular Subbase	55,000 C.Y.
10" Reinforced Portland Cement Concrete Pavement	203,200 S.Y.
3" Bituminous Concrete Shoulders	85,800 S.Y.
Guard Rail	38,300 L.F.
Right-of-Way Fence	33,600 L.F.
Metal Shell Cast-in-Place Piling	145,700 L.F.
Steel H Piles, 14"—73#	11,600 L.F.
Structure Concrete	34,600 C.Y.
Reinforcing Steel	4,878,000 Lbs.
Prestressed Concrete Girders, Erection	28,600 L.F.



Previously advertised bids for Contracts T-9A, T-9B, T-9AB and T-1C will be opened May 2, 1957.

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BUILDINGS—SLC

Que., St. Victor de Beauce—SEMINARY—L'Oeuvre des Vocations Sacerdotales, St. Victor de Beauce, soon let contract 5 story, bsmnt., 55x205 ft. rein.-con. seminary extension, rue principale. $700,000. J. Berchman Gagnon, 97 rue Notre Dame, Thetford Mines, archt.

HEAVY CONSTRUCTION—LB & CA

NORTHWEST TERRITORIES—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.,

McNamara Constr. Co., 42 Industrial St., Leaside, Toronto, Ont. CA $695,172 (5 bidders) grading, culverts, Mile 0 to Mile 20, Yellowknife to Fort Rae Hy. Awarded Mar. 29. CD 3/25, under LB.

Valentine Contg. Co. Ltd., 131 Cartwright Ave., Toronto, Ont. LB $177,000. supply and constr. approx. 3,56 lin. ft. 36 in. sewer with appurtenances, sewage pumping station, 18x26 ft., 20 ft. deep, complete with superstructure barminutor pumping equip., overflow pipe, water and power supply, etc., North York Twp., TORONTO, ONT. Downsview Meadows Ltd., c/o R. V. Anderson & Assocs., Ltd., engrs., 194 Wilson Ave., Toronto, Ont. Bids Mar. 28. CD 3/20.

Sam Cosentino Ltd., 80 Hymus Rd., Toronto, Ont. C $841,500. (17 bidders) Part B, constr. open cut & twin pipe sewers from Eastern Ave. sewage pumping station to Rhodes Ave., 2,780 ft., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Gore & Storrie Ltd., 1130 Bay St., Toronto, Ont., and James F. MacLaren Assocs., 321 Bloor St. E., Toronto, Ont., engrs. Awarded Mar. 28.

▲ Dominion Underground Constr. Co., 4763 Redford St., Detroit, Mich. CA $4,247,000. (15 bidders) about 11,339 ft. sanitary trunk sewer in tunnel, Coxwell Ave., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St., E., Toronto, Ont. Gore & Storrie Ltd., 1130 Bay St., Toronto, Ont., and James F. MacLaren Associates, 321 Bloor St., E., Toronto, Ont., engrs. Award Mar. 28.

▲ Sir R. McAlpine & Sons Canada Ltd., Box 249, Weston, Ont. LB $1,058,122 (16 bidders) road work at Dundas St. West and Royal York Rd. interchange, consisting of grading, drainage, paving, Contr. 6-57, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. W., Toronto, Ont. Bids Apr. 1. CD 3/25;

Dufferin Constr. Co., Ltd., 2700 Dufferin St., Toronto, Ont. LB $340,160 (13 bidders) Eglinton Avenue East extension b. conc. pavement on roads from Brentcliffe Rd. to C.P.R. right-of-way and from C.P.R. right-of-way to Don Mills Rd. (Toronto, Ont.).

Michaud & Simard, Inc., 575 rue Arago, Quebec City, Que. CA $344,000. excavation of house fdns., landscaping, storm drainage and site completion of some 205 HOUSES, BAIE COMEAU, QUE. Canadian British Aluminum Co. Ltd., 1980 Sherbrooke St. W., Montreal, Que. Bids Feb. 23, awarded Mar. 28. CD 1/24

BUILDINGS—LB & CA

▲ Burns & Dutton Concrete & Constr. Co. Ltd., 9004 125 Ave., Edmonton, Alt. LB $1,884,550. (5 bidders) HIGH SCHOOL and HOSTEL, YELLOWKNIFE, NORTHWEST TERRITORIES. Dept. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Mar. 27. CD 11/26.

Bathe & McLellan Ltd., 81 King St. W., Oshawa, Ont. CA $712,000 (6 bidders) 2 story, part bsmnt., 175x248 ft., steel, brick HIGH SCHOOL, OSHAWA, ONT. Bd. Educ., 179 Simcoe St. E., Oshawa, Ont. Bids Mar. 13 CD 2/13.

▲ Louis Donolo Ltd., 2790 Dufferin St., Toronto, Ont. CA $2,374,000. (4 bidders) two rein.-con. APARTMENTS, Regent Park South, TORONTO, ONT. Federal-Provincial-Municipal Partnership, Central Mortgage & Housing Corp., 40 Eglinton Ave. E., Toronto, Ont., Housing Division, Ontario Dpt. of Planning & Development, Parliament Bldgs., Toronto, Ont., and City of Toronto, City Hall, Toronto, Ont. Page & Steel, 52 St. Clair Ave. W., Toronto, Ont., archts. Awarded Mar. 29;

Consolidated Building Corp., 89 Avenue Rd., Toronto, Ont. CA $1,800,000. (5 bidders) 148 HOUSING UNITS, Regent Park South, J. E. Hoare Jr., 481 Eglington Ave. W., Toronto, Ont., archt. (Toronto, Ont.)

Marshall Development Co., 17 Mill St., Willowdale, Toronto, Ont. CA Est. $600,000. 8 story, 60x120 ft. rein.-con. APARTMENT, 54 units, TORONTO, ONT. 169 St. George St. Ltd., 17 Mill St., Willowdale, Ont. Crang & Boake, 79 Huntley St., Toronto, Ont., archts. Awarded Mar. 27.

Toronto Industrial Leaseholds Ltd., 12 Sheppard St., Toronto, Ont. Owner Builds. $200,000. 1 story, 30,000 sq. ft. FACTORY, Alliance Ave. and Rockcliffe Blvd., TORONTO, ONT.

Will-Art Constr. Co., Ltd., 46 Goineau Blvd., Pont Viau, Montreal, Que. Owner Builds. $350,000. HOUSING, 33 split level bungalows, Goineau Blvd., MONTREAL, QUE.

Foundation Co. of Canada, Ltd., 1900 Sherbrooke St. W., Montreal, Que. CA $500,000. 2nd story brick, concrete bottling PLANT addn., 3rd story addn. to administration bldg., VALLEYFIELD, QUE. Canadian Schenley Ltd., (Quebec Distilleries), Salaberry St., Valleyfield, Que. David Shennan, Canada Cement Bldg., Montreal, Que., archt. Awarded Mar. 25.

ALASKA

HEAVY CONSTRUCTION—BA

† Alaska—RUNWAY—BA 4/30—Procurement Officer, Ladd Air Force Base, repair north runway, Fairbanks, Inv. 57-164. CD 11/25/52.

HEAVY CONSTRUCTION—LB & CA

▲† Patti-MacDonald and M-B Contg. Co., 1340 Admiral Blvd., Kansas City, Mo. LB $2,795,371.

(Continued on page 154)

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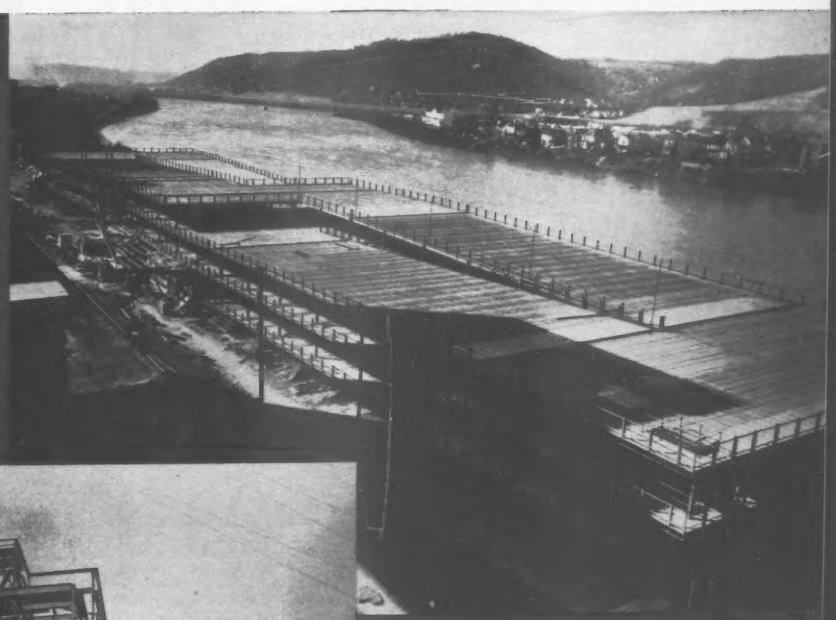

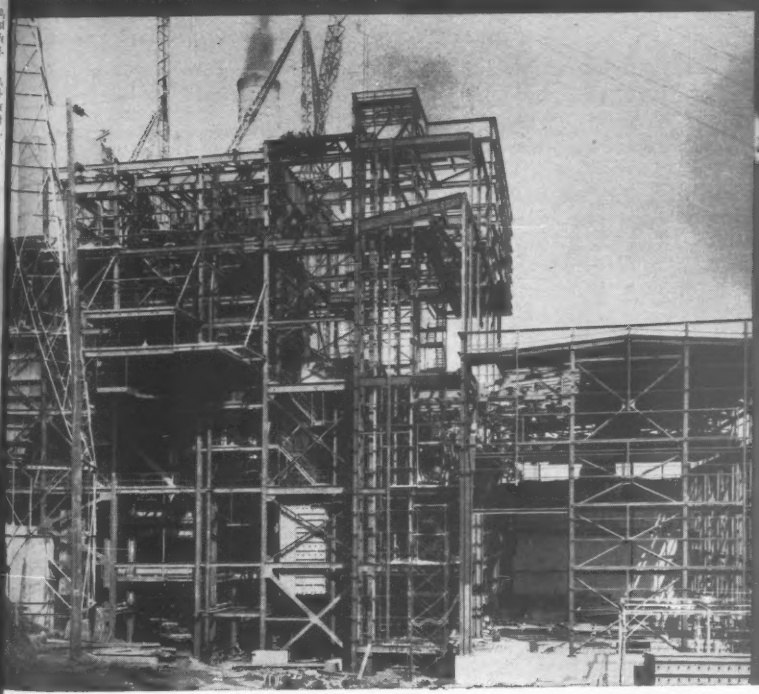

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Continued from page 152

Schedule A, $3,212,266 est. Schedule B, $3,506,327 Schedule C, (6 bidders) three army nike sites in Fort Richardson Area, near Anchorage, Inv. 57-30, Alaska. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Mar. 26.

† **Radio Corp. of America,** 30 Rockefeller Plaza, New York, N. Y. LB $274,489 (2 bidders) constr. microwave communication system, ALASKA. The Alaska R.R., Dpt. Interior, Anchorage, Alaska. Bids Mar. 22. CD 3/11.

† **W. A. Smith Contg. Co.,** 1401 Fairfax Trafficway, Kansas City, Mo. LB $870,055 (3 bidders) ballasting and surf. 44.7 mi. main line and 3½ mi. spurs between Anchorage and Wasilla, ALASKA. The Alaska R.R., Dpt. Interior, Anchorage, Alaska. Bids Mar. 28. CD 3/15.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

† **Labrador**—AIR FORCE BLDGS.—BA 4/30—U. S. Eng., 346 Broadway, New York 13, N. Y., U. S. A., air force bldgs., utilities at Goose Bay Air Base, Proj. ENG-30-347-57-20. Plans deposit $50. CD 1/29.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ala., Birmingham**—Birmingham Water Works Bd., 2114 First Ave. N., filter plant and pumping station in Ensley-Pratt City area. $2,000,000-$2,500,000. CD 8/21/52.

▲ **Ariz., Phoenix City**—City, City Hall, $35,000,000 bond election May 7, purchase private water company and make imprvs.

Iowa, Osceola—City, Milan Blake, city clk., voted $175,000 bonds Mar. 17 WW sys. imprvs., incl. 300,000 gal. tank on tower, foundations, etc. and raising existing dam and spillway 10 ft. to increase storage capacity of city reservoir. $175,000. Rowat-Murray Engineers, Belmond, consult. engrs.

▲ **Kan., Parsons**—City, Paul Freeberg, city engr., City Hall, water sys. imprvs., extens., incl. storage reservoir on Labette Creek; temporary rock dam on Neosho River, floodgate for existing dam on river and a water storage tank, auxiliaries, appurtenances, $1,300,000, Wilson & Co., 705 E. Crawford St., Salina, consult. engrs. CD 2/27.

Mass., Lexington—Town, Bd. P. Wks., Town Office Bldg., Lexington, replacing water mains. $106,600. Constr. in 1957.

Mass., New Bedford—City, Dpt. P. Wks., City Hall, water sys. 5 mi. 42 in. water main. $300,000. Constr. in 1957-1958.

Minn., Excelsior—Village, voted $175,000 bonds Mar. 26, water sys. imprvs., incl. drilling two wells, installing softening and purification equip., constr. addl. reservoir. Schoell & Madson, 8134 Minnetonak Blvd., Minneapolis, consult. engrs. To go ahead in 1957. CD 3/18.

▲ **Minn., St. Paul**—City, Water Dpt., City Hall, L. N. Thompson, genl. mgr., WW imprvs.,
constr. six new filters at filtration plant, McCarran's Lake. $859,100;
two 230x82x20 ft. addnl. sedimentation beds at filtration plant. $638,000;
new 60 in. conduit length 8 mi. from Mississippi River Station to Pleasant Lake. $2,750,000;
new 60 in. concrete conduit from Pleasant Lake to Sucker Lake about ½ mi. $583,000;
furnish, install new pump, 25 m.g. capacity at Mississippi River Station. $143,000;
furnish, install two new pumps at McCarron's Station, 12 in. and 30 in. $220,000;
constr. new 10 m.g. concrete reservoir in east side of city. $550,000. Constr. in 1957-58-59. CD 11/19/54.

▲ **N. J., Trenton**—City, City Hall, 4 elevated water tanks in White Horse, Mercerville, Ewing & Lawrence Sections. $250,000. Louis Klockner, city water supt.

O. Toledo—City, Russell Rink, mgr., City Hall, service bldg. for water division, $450,000. Sanzenbacher, Miller & Brigham, 3023 Sylvania St., consult. engrs. CD 8/27.

Okla., Cushing—City, defeated $250,000 bonds WW exten. W. C. Albright, city engr. CD 3/13.

S. D., Huron—City, imprv. water system, $720,000. CD 12/30/55.

Tex., Grand Prairie—City, 24 in. water main leading to 1,900 acre tract of Great Southwest Corporation. $125,000. Homer A. Hunter, 3708 Abrams Rd., Dallas, consult. engr.

▲ **Tex., Midland**—City, c/o City Hall, voted bonds Mar. 23, WW. $1,900,000.

Wis., Hartford—City, City Hall, water mains and elevated tower, $120,000. Ruekert & Mielke, 420 Frederick St., Waukesha, consult. engrs.

Alaska, Fairbanks—City, City Hall, extending water lines to south Fairbanks. $100,000. R. W. Beck & Assocs., Tower Bldg., Seattle 1, Wash., consult. engrs. CD 7/30/45.

Que., Berthier—Municipality, Municipal Bldg., Imprv. WW sys. $100,000.

SEWERS, WASTE DISPOSAL

▲ **Ariz., Phoenix**—City, City Hall, $14,000,000 bond election May 7, sanitary and storm sewers. CD 1/23/56.

▲ **Calif., San Bernardino**—City, City Hall, defeated bonds Mar. 19, sewerage collection system and related projects. $4,900,000. CD 2/7.

▲ **Calif., Vallejo**—Vallejo Sanitation & Flood Control Dist., c/o Manager, 450 Ryder St. sewage disposal plant. $1,500,000. Brown & Caldwell, 66 Mint St., San Francisco, consult engrs. CD 12/11.

▲ **Conn., Middletown**—City, sewers, Millbrook, E. Main St., Pameacha, addn. to Kennedy Meadows Disposal System, $1,500,000.

Conn., Naugatuck—Borough of Naugatuck, storm sewer, S. Water and Bridge Sts. $105,000. Bids in May. CD 4/25/56.

▲ **Ind., Richmond**—Richmond Sanitary Dist., Richmond, interceptor sewers west of here, $1,500,000, Henry Steeg & Assoc., 3338 N. Illinois, Indianapolis, consult. engrs. CD 3/18.

▲ **La., Harahan**—City, sanitary sewerage sys. $1,647,015 Roessle & Galloway, 3012 Metairie Rd., Metairie, engrs. CD 3/25.

Mass., Braintree—Town, Sewer Dpt., Town Hall, sewers. $245,000. Constr. in 1957.

Mass., Lexington—Town, Bd. P. Wks., Richard J. Gayer, supt., Town Office Bldg., Lexington, sewers. $165,800. Constr. in 1957.

▲ **Miss., Clarksdale**—City, City Hall, sewerage sys. $1,250,000, Brewer & Skewes, Clarksdale and Allen & Hoshall, 65 McCall Pl., Memphis, Tenn., engrs. CD 3/26.

Mo., Lamonte—City, City Hall, sewerage sys. $100,000.

Mo., Marshall—City, postponed Apr. 2 bond election, sewerage sys. imprvs. $350,000, Haskins, Riddle & Sharp, Finance Bldg., Kansas City, Mo., consult. engrs. CD 3/1.

▲ **O., Struthers**—City, sewage disposal plant, Struthers-Lowellville Rd. $1,350,000. Floyd S. Brown & Assocs., Marion, consult. engrs. CD 11/22/55.

Pa., Kingston—Kingston Boro, sewage disposal plant. $750,000. Harris-Dechant Assoc., Fidelity Phila. Trust Bldg., Phila., engrs. CD 10/31/46.

Tex., Fort Worth—City, co Dr. Jack Garrison, mayor, Fort Worth, storm drain in Brookside addn., $112,000; storm drain in University Dr., $180,000. Joe J. Rady, 511 Insurance Bldg., consult. engr. Bids soon. CD 2/8/56.

▲ **Tex., Midland**—City, c/o City Hall, voted bonds Mar. 23, sanitary sewerage system, $1,000,000; storm sewers, $300,000.

Tex., Van Alstyne—City, sewage treatment plant. $75,000. sanitary sewer lines. $85,000. Koch & Fowler, 3900 Lemmon St., Dallas, consult. engrs.

Wash., Cosmopolis—Town, Town Hall, sewage treatment system and plant. $260,000. H. T. Harstad & Assocs., 1000 Lenora St., Seattle, consult. engrs.

Wyo., Worland—Town, Town Hall, voted $147,000 bonds lagoon type sewage disposal facility on north side of town.

BRIDGES

▲ **ARIZONA**—State Hy. Dpt., Phoenix,
Maricopa Co.—Durango Interchange, Phoenix Freeway Section, incl. 3 level structures at Durango and 23 Ave. Phoenix, FAI Project. $1,000,000. Johannessen & Girard and Earl V. Miller, 415 Central and Washington Bldg., Phoenix, consult. engrs.

▲ **Calif., Palo Alto**—City, c/o Clerk, City Hall, bond election May 14, subway underpass linking Page Mill Rd. and Oregon Ave. $2,100,000.

Calif., Santa Rosa—Sonoma Co., c/o Clerk, Courthouse, bridge across Laguna De Santa Rosa on Guerneville Hy., near here. $217,230. CD 8/1/45.

Ill., Highland Park—City, City Hall, 4 bridge addns. at Beech St., Cedar Ave., Forest Ave. and Revine Dr. $360,000. Suter & Commerschield, 39 S. LaSalle St., Chicago, consult. engrs.

Wash., Moses Lake—City, City Hall, bond election May 7, widening Alder St. causeway across Parker Horn, $200,000. constr. second crossing over Parker Horn and causeway over Pelican Horn, $500,000. Gray & Osborne, 228 S. 2 St., Yakima, consult. engrs.

STREETS AND ROADS

▲ **ARIZONA**—State Hy. Dpt., 17 Ave. and Jackson St., Phoenix,
Maricopa Co.—new freeway, Black Canyon Hy. exten., grade separations, interchanges, widening N. 7 St. and N. 7 Ave. ingress highways, FAI Project. $40,000,000.

▲ **Ariz., Phoenix**—City, City Hall, $6,000,000 bond election May 7, street imprvs.

Calif., Eureka—Humboldt Co., c/o Clerk, Courthouse, Eureka, road repairs to flood damaged roads. $800,000. Winzler & Winzler, 730-5th St., consult. engrs. CD 2/8/45.

Calif., Patterson—City, City Hall, curbs and gutters, city wide proj. $108,628.

Calif., San Bernardino—City, City Hall, defeated bonds Mar. 19, street imprvs. $270,000. CD 2/25.

Connecticut—State Hy. Dpt., 165 Capitol Ave., Hartford,
Middlesex Co.—relocation of Route 9 from Union St. to Acheson Dr., Middletown. $1,500,000. Bids in April. Mapes, Taylor, Thompson & Westcott, 109 Church St., New Haven, consult. engrs.

Mass., Arlington—Town, Town Hall, development 9 streets. $255,177. Constr. in 1957.

N. H., Concord—City, City Hall, hy. drainage, $125,000. Camp, Dresser & McKee, 6 Beacon St., Boston, Mass., consult. engrs. CD 3/14.

▲ **OHIO**—State Hy. Dpt., Columbus,
104 mi. Columbus-Cleveland leg of 4-lane limited access highway to take the place of the north end of once recommended Turnpike No. 2. $104,000,000. Engineering consultants as follows:
Ammann & Whitney, 111 8th Ave., New York, N. Y. from Route 36 near Columbus to Route 95 near Mount Gilead;
Porter, Urquhart, McCreary & O'Brien, 415 Frelinghuysen Ave., Newark, N. J., Route 95 to Route 97 near Lexington in Richland Co.;
Shaffer, Parrett & Assocs., 137 Lexington Ave., Mansfield, O., Route 97 to point near Ashland;
Michael Baker Jr., Rochester, Pa., from near Ashland to point south of Lodi in Wayne County;
Beiswenger, Hoch & Assoc. Inc., 661 W. Market St., Akron, O., from near Lodi to State Route 18 east of Medina;
and J. E. Greiner Co., 1106 N. Charles St., Baltimore, Md., from Route 18 to Cleveland area. CD 3/11.

▲ **Pa., Pittsburgh**—Bd. Comrs. Allegheny Co., County Bldg., constr. Ravensburg Blvd., Clairton. Green Engineering Co., 504 Beaver St., Sewickley, consult. engrs. CD 12/15/43.

Tex., Midland—City, City Hall, voted bonds Mar. 23, street imprvs., paving. $500,000.

Tex., Pasadena—Greater Downtown Pasadena Assn., c/o Doughtie & Porterfield, archts., 817 S. Tatar St., conversion of streets into malls. $400,000.

Wash., Olympia—State Capitol Comm., State Capitol, Olympia, access road from new Olympia Freeway to capitol grounds. $151,000.

▲ **Que., Montreal**—City, City Hall, parkway over Mount Royal incl. two 24 ft. roadways with 10 ft. embankment on Remembrance Rd. and one 24 ft. road with 10 ft. embankment from Remembrance Rd. to Mount Royal Blvd., from Cote Des Neiges Rd. to Blvd. Mount Royal. $1,070,000. Lalonde, Girouard & Letendre, 7379 St. Hubert St., consult. engrs.

EARTHWORK, WATERWAYS

▲ **Calif., San Jose**—Santa Clara Valley Water Conservation Dist., 60 N. 2nd St., voted $3,000,000 bonds Mar. 26 water supply, incl. canal distr. system. CD 9/24/52.

† **Florida**—U. S. Eng., Box 4970, Jacksonville, dredging Bayboro Harbor Basin and A Channel in mouth of Salt Creek, CIVENG-08-123-57-60, St. Petersburg Harbor. Bids Apr. 25. CD 11/24/53.

Ont., Orangeville — Credit Valley Conservation Auth., Mississauga Rd., Port Credit, flood control dam in Munro Twp. east of here. $500,000.

AIRPORTS

▲ **Ariz., Phoenix**—AIRPORT—City, City Hall, $5,000,000 bond election May 7, airport imprvs. CD 2/19.

Ark., Blytheville—RUNWAY—City, City Hall, constr. 3,000 ft. asphaltic surfaced runway, municipal airport imprvs. $100,000. CD 12/6/44.

Calif., Oxnard—AIRPORT—Co. Bd. Supervs., Ventura Co. Court House, Ventura, alter Oxnard-Ventura County Airport Flight Strip, add 2,000 ft. $300,000.

N. H., Lebanon—AIRPORT FACILITIES—Town, Airport Comn., Floyd Eastman, chn., airport facilities, Municipal Airport, $100,000. Fay, Spofford & Thorndike, 11 Beacon St., Boston, Mass., consult. engrs. CD 1/8/45.

▲ **N. J., Newark**—CONTROL TOWER—Port of New York Authority, 111 Eighth Ave., New York 11, N. Y., 11 story control tower 150 ft. high, 38x42 ft. area, Newark Airport. $1,000,000. CD 1/18/54.

FOREIGN

▲ **Greece, Alexandria**—City of Alexandria, plans modernization and expansion of city's sewerage system. Excess $1,000,000.

PUBLIC BUILDINGS

Ariz., Phoenix—AUDITORIUM—City, First Ave. and Washington St., plans by John Sing Tang, 2215 N. Central Ave., 3,000-seat auditorium as joint school-community use, at new Central High School site. $800,000.

▲ **Ark., Pine Bluff**—HOSPITAL—Jefferson Co., Hon. Joe Henslee, judge, Pine Bluff, $2,250,000 bond election Apr. 23, county hospital. $4,500,000. Reed & Willis, First Natl. Bank Bldg., Pine Bluff, and Wittenberg, Delony & Davidson, Pyramid Life Bldg., Little Rock, assoc. archts. CD 3/20.

▲ **Ariz., Flagstaff**—LIBRARY, etc.—University of Arizona, Flaggstaff, existing library addn., administration bldg. and remodeling portion of existing bldg. $581,500; 3 story classroom bldg. for industrial arts, home economics, arts and crafts, $975,000.

▲ **Ariz., Phoenix**—CITY HALL, etc.—City, City Hall, $5,200,000 bond election May 7, city hall, police compound, library addns.

▲ **Ariz., Tucson**—COLLEGE, etc.—University of Arizona, Tucson, engineering college facilities addns., remodeling. $400,000; home economics bldg. $906,610; geology bldg., $1,551,250; power plant addns., $274,540. CD 1/28/49.

Calif., Al Tahoe—SCHOOL—Lake Tahoe Unified School Dist., c/o Supt., Box 217, voted bonds Jan. 8, constr. elementary school. $525,000. Jack Buchter & Assoc., 61 Morag Hy., Orinda, archts. CD 1/14/54.

Calif., Fresno—SCHOOL—Scandinavian School Dist., c/o Supt., 2314 Mariposa St., plans by Maurice J. Metz, 701 Helm Bldg., Scandinavian Elementary School No. 4, Maple and Gettysburg Sts. $500,000. CD 3/14/56.

Continued on page 156

WISCONSIN cuts costs with HIGH DENSITY OVERLAID* plywood signs

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The Traffic Services Section of the State Highway Commission of Wisconsin has experimented with every type of sign material on the market. On the basis of tests and field experience, it is now using considerable amounts of high density overlaid plywood for reflectorized highway signs. The commission cites these three reasons why:

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(Continued from page 154)

Calif., Los Angeles—SCHOOL—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by Eugene Weston, Jr. & Kieth P. Marston, 1741 Silverlake Blvd., Charles Evans Hughs Junior High School, 6201 Winnetka Ave., Canoga Park. $850,000. CD 4/8/55.

Calif., Martinez—SCHOOL—Martinez Elementary School Dist., c/o Supt., Martinez, plans by Schachtman & Velikonia, 333 Maryland St., Vallejo, Alhambra Valley Elementary School. $630,000.

▲ **Calif., Newman**—SCHOOL—Orestimba Union High School Dist., c/o Supt., P. O. Box 578, defeated bonds Mar. 14, high school. $1,100,000. CD 1/7.

Calif., Ontario—SCHOOL—Ontario School Dist., Ontario, plans by Jay Dewey Harnish & Eugene Weldon Fickes, Jr., 222 E. "B" St., 1 story, 17,900 sq. ft., frame, stucco, Ontario Junior High School No. 17 addn.

▲ **Calif., Riverside**—COUNTY—Bd. Supervs. Riverside Co., Riverside, $5,465,000 bond election June 11, to finance county bldgs. CD 9/26/45.

Calif., San Bernardino — LIBRARY — City, City Hall, defeated bonds Mar. 19 new library. $800,000. CD 2/25.

▲ **Calif., San Bernardino**—HOSPITAL—Bd. Supervs., San Bernardino Co., Court House, plans by Jay Dewey Harnish & Eugene Weldon Fickes Jr., 222 E. "B" St., Ontario, Phase 2, 5 story, 89,000 sq. ft., rein. con. San Bernardino Co. Hospital addn. $1,500,000. CD 12/18/53.

Calif., San Luis Obispo—STUDENT HEALTH—State Div. Architecture, Pub. Wks. Bldg., 1120 N. St., Sacramento, student health bldg. at California State Polytechnic College Campus. $551,560.

Calif., South San Francisco—SCHOOL—South San Francisco Unified School Dist., c/o Supt., 398 B St., plans by Donald Francis Haines, 268 Market St., San Francisco. Sunshine Gardens Elementary School addn. $606,260. CD 3/29/56.

Colo., Alamosa—DORMITORY, etc.—State, Denver, plans by Joseph T. Wilson, Masonic Bldg., dormitory and apartment buildings, Adams State College. $600,000. CD 3/22/57.

▲ **Conn., Bridgeport**—RESTAURANTS—State Hy. Dpt., 165 Capitol Ave., Hartford, 2 restaurants on either side of Merritt Parkway. $1,000,000. CD 8/18/54.

Conn., Middletown—SCHOOL—Town, addn. to Bertrand E. Spencer School, Westfield St. $400,000.

Conn., Seymour—HOUSING—Seymour Housing Auth., 34 Second St., plans by Olson & Miller, 742 Asylum Ave., Hartford, housing, 26-rental units, Chamberlain Rd., 13 bldgs. $605,000. CD 1/30/52.

Conn., Stamford—NURSING HOME—City, addn. to Nursing Home at Sunset Home (City Home for Indigent). $450,000.

Conn., Willimantic—DORMITORY, etc.—State P. Wks. Dpt., 165 Capitol Ave., Hartford, Women's Dormitory and student union bldg., Willimantic State Teachers' College. $405,000. CD 1/13/49.

Ind., Richmond—SCHOOL—Wayne Twp., Wayne Co., County Court House, 2 story, 86x245 ft. rein.-con., structural steel, masonry Pleasant View School. $400,000. R. W. Clinton & Assocs., 321 Colonial Bldg., consult. engrs.

Iowa, Ottumwa—SCHOOLS—Bd. Educ., Joe C. Ferguson, pres., Ottumwa, voted $750,000 bonds, Mar. 11, two elementary schools. CD 2/21, under Iowa, Ottumwa. (Correction-location of project.).

Iowa, Tripoli—SCHOOL—Bd. Educ., Tripoli, voted bonds, high school. $410,000.

La., Baton Rouge—SCHOOL—East Baton Rouge Parish, Court House, plans by I. Gayden Thompson Associates, Doherty Bldg., 3160 Florida St., North Western High School and Auditorium, Zachry. Approx. $350,000. CD 3/23/53.

Md., Cheverly—HEALTH and WELFARE—Prince George's Co., Health Dpt., Upper Marlboro, plans by Paul H. Kea, 5109 Baltimore Ave., Hyattsville, health and welfare bldg. on site of Prince George's General Hospital. $500,000.

Mass., Ashburnham—SCHOOL—Town, School Dpt., Junior Senior High School. $850,000. Constr. in 1958. CD 2/21/56.

▲ **Mass., Granby-Belchertown** — SCHOOL — Towns of Granby and Belchertown, Regional School Comn., c/o supt. schools, Granby, Regional Junior-Senior High School, $2,250,000. Constr. in 1958.

▲† **Mass., Natick**—HOUSING—U. S. Eng., 150 Causeway St., Boston, plans by Samuel Glaser & Assoc., 235 Clarendon St., Boston, housing (Capehart), Quartermaster Research Laboratory. $825,000. Constr. in 1957. CD 3/14/51.

Mass., Salem—HOUSING—Salem Housing Auth., 16 Rainbow Terrace, plans by John J. Mahoney Assoc., 61 Jefferson Ave., Salem, 40 housing units. $350,000. Constr. in 1957. CD 1/31/52.

Mass., Wilmington—SCHOOL—Town, Elementary School Bldg. Comn., Church St., plans by Donaldson Ray McMullin, 698 Mass. Ave., Cambridge, elementary school, Silver Lake Area. $450,000. Constr. in 1957.

▲ **Mass., Worcester**—PARKING GARAGE—City, Dpt. P. Wks., 20 E. Worcester St., plans by L. W. Briggs Assoc., Inc., 90 Park Ave., parking garage, 2 sections, between Pearl and Elm Sts., $1,050,000. Ramp Building Corp. of New York, 230 Park Ave. New York N. Y., parking consultants, Lester W. West, 306 Main St., Worcester, designer. CD 6/2/55.

▲ **Mich., St. Clair Shores**—SCHOOL—City, Lakeview School Dist., 21100 E. 11 Mile Rd., bond election Apr. 29, Junior High School, elementary school. $3,000,000. CD 1/16.

▲ **Mich., St. Joseph**—SCHOOL—City, Bd. Educ., $3,500,000 bond election May 27, high school, $3,000,000; North Lincoln Elementary School addn.

Minn., Minneapolis—SCHOOL—Bd. Educ., H. Held, archt.-engr., 807 N. E. Broadway, plans by Magney, Tusler & Setter, 303 Roanoke Bldg., Roosevelt High School, 4029 28 St. South. $500,000. Bids in 1957-1958.

▲ **Minn., St. Paul**—WORKHOUSE—City of St. Paul, and Ramsey Co., Detention and Workhouse Facility Comn., F. Marizitelli, chn. annd B. M. Troje, exec. secy., 945 Court House, plans by R. R. Gauger & Co., 421-2 First Federal Bldg., St. Paul, workhouse Upper Afton Rd. to Burns Ave. with Ruth St. on west and Ramsey Co. line on east. $1,300,000. Bids in August. CD 9/26.

Minn., Virginia—SCHOOL—Bd. Educ., J. Littlewolf, clk., plans by Damberg & Damberg, Virginia, elementary school. $725,000.

▲ **Minn., White Bear Lake**—SCHOOL—Bd. Educ., R. J. Hanson, supt. voted $2,000,000 bonds Mar. 26, school site acquisition, Belair School addn. Haarstick, Lundgren & Assocs., N. 212 First National Bank Bldg., St. Paul, archts.

N. J., Blackwood—SCHOOL—Gloucester Twp. Bd. Educ. plans by Petty & Croft, Moorestown, elementary school, Blenheim Rd. $344,000.

▲ **N. J., Elizabeth**—OFFICE—Bd. Freeholders Union Co., County Courthouse, office with underground parking facilities, South Union St., $3,000,000.

N. J., Hillside—SCHOOL—Bd. Educ., Hillside Twp., plans by Pohlman & Henry, 1140 E. Jersey St., Elizabeth, high school addn. $550,000.

N. J., Hopewell—SCHOOL—Bd. Educ., Borough of Hopewell, plans by Hankin, Stahl & Backes, 495 W. Hanover St., Trenton, elementary school addn. for Borough of Hopewell. $350,000. CD 4/4.

▲ **N. J., Jersey City**—HOUSING—Jersey City Housing Auth., City Hall, 21 story apartment houses in Gregory St. area. $20,000,000.

N. J., Mountain View—SCHOOL—Bd. Educ., Wayne Twp., plans by Emil Schmidlin, 586 Central Ave., East Orange, high school addn. $770,000.

▲ **N. J., Phillipsburg**—SCHOOL—Bd. Educ., South Main and Jersey Sts., plans by Fred P. Widersum, 1051 Bloomfield Ave., Clifton, high school addn., Hillcrest Blvd. $2,000,000.

N. J., Somers Point—SCHOOL—Somers Point Bd. Educ., elementary school, Fairways Sect. $344,000.

N. Y., Pleasantville—SCHOOLS—Bd. Educ. voted bonds Mar. 21, addn. to 4 schools, $740,000.

▲ **N. Y., Honeoye Falls**—SCHOOL—School Bd., elementary school and addn. to present high school to make it a Junior Senior High School. $1,060,000.

(Continued on page 159)

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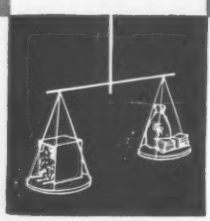

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(Continued from page 156)

▲ O., Columbus—SCHOOL—Southwest School Dist., 1390 Harrisburg Pike, $1,600,000 bond election July 23 high school near Darbydale; elementary school addn.

O., Cortland — SCHOOL — Bazetta Twp. Bd. Educ., $372,000 bond election June 18, school. G. Donald Schade, 152 High St. N.E., Warren, archt.

▲ O., Dayton—SERVICE, etc.—City, Herbert W. Sarick, mgr., City Hall, plans by Lorenz & Williams, 223 W. First St., service bldg. $1,000,000; centralized garage, $500,000, Ottawa St. city yard property.

O., Medina—HOSPITAL—Medina Community Hospital, Medina, hospital addn. $450,000.

▲ O., Mineral Ridge—SCHOOLS—Weatherfield Twp. Bd. Educ., Mineral Ridge, defeated $1,100,000 bonds, new grade school and high school addn. CD 2/28.

O., Parma—SCHOOL—Catholic Diocese of Cleveland, 1027 Superior Ave., Cleveland Zone 14, plans by John Lipaj, The Arcade, Cleveland, Zone 14, school for St. Columbkille's Parish. $610,000. Bids by invitation in June.

Ore., Seaside—SCHOOL—Seaside Union High School Dist., Seaside, voted $386,000 bonds, high school. $526,000. CD 3/1.

Pa., Clarks Summit—CHAPEL, etc.—General State Auth., 18 and Herr Sts., Harrisburg, plans by Von Storch & Burkavage, 117 S. 17 St., Phila., chapel, auditorium, gymnasium at Clarks Summit State Hospital, $400,000. A. F. Jones, ch. engr. CD 3/1/56.

▲ Pa., Darby—SCHOOL—Darby School Dist., Darby and State Pub. School Bldg. Auth., 101 S. 25 St., Harrisburg, plans by Horace W. Castor, Architects Bldg., Phila., school. $1,180,000. CD 3/9/56.

▲ Pa., Farrell—SCHOOL—Hickory Twp. School Dist. Farrell and State Pub. School Bldg. Auth., 101 S. 25 St., Harrisburg, plans by Kling & Frost, 661 Wick Ave., Youngstown, O., schools. $1,350,000. CD 3/8/56.

Pa., Morrisville—SCHOOL—Lower Makefield Bd. Educ., plans by Hankin, Stull & Backes, 495 W. Hanover St., Trenton, N. J., elementary school. $344,000.

Pa., Shamokin—HOSPITAL—State Dpt. Property & Supplies, Capitol Bldg., Harrisburg, Shamokin State Hospital wing. $444,800.

Pa., Warren—STORAGE AND REFRIGERATION—General State Auth., 18 and Herr Sts., Harrisburg, plans by Liff & Justh, Standard Life Bldg., Pittsburgh, 2 story storage and refrigeration. Warren State Hospital. $800,000. A. F. Jones, ch. engr. CD 4/2/56.

▲ Pa., Woodville—PATIENTS—General State Auth., 18 and Herr Sts., Harrisburg, plans by Button & McLean, 119 E. Montgomery Ave., Pittsburgh, TB patients bldg., Woodville State Hospital. $1,920,000. A. F. Jones, c/o owner, ch. engr. CD 3/2.

R. I., Exeter—EDUCATIONAL, etc.—State R. I. & Prov. Plants, Div. Purchase, State House, Providence, plans by Creer, Kent, Cruise & Aldrich, Industrial Bank Bldg., Providence, educational and recreational bldg. State School Over $345,000. CD 11/9.

Tenn., Johnson City—STUDENT CENTER, etc.—State Bldg. Comn., Nashville, plans by Beeson & Sons, Sells Bldg., enlarging student center and cafeteria, East Tennessee State College. $400,000. CD 10/20/50.

Tenn., Memphis—PHYSICAL EDUCATION—State Bldg. Comn., Nashville, plans by D. Y. McGown, 1503 Union Ave., remodeling physical education bldg., Memphis State University. $700,000.

Tenn., Mufreesboro—RESIDENCE HALL—Tennesee State Bldg. Comn., Nashville, plans by John Charles Wheeler, Murfreesboro, men's residence hall, Middle Tennessee State College. $500,000.

Tex., Athens—HOSPITAL—Henderson Co. Memorial Hospital, Athens, plans by Hedrick & Stanley, archts. and consult. engrs, Box 765 Fort Worth, hospital addn. $400,000.

▲ Tex., Beaumont—DORMITORY, etc.—Lamar State College of Technology, Dr. F. L. McDonald, pres., Beaumont, 3 dormitory and housing projects, $1,200,000; classrooms (2nd unit) $1,400,000.

Tex., Carrizo Springs—SCHOOL—Carrizo Springs Independent School Dist., Carrizo Springs, plans by Johnson, Dempsey & Collins, 918 Manor Dr., San Antonio, high school. $400,000.

Tex., College Station—WIND TUNNEL—A&M College of Texas, Research Foundation, College Station, constr. wind tunnel (Proposal Nos. 1, 2 & 3). $100,000. W. E. Simpson Co., 945 Milam Bldg., San Antonio, consult. engrs.

Tex., Fort Worth—SCHOOL—Castleberry Common School Dist., O. D. Strother, trustee, chn. Bd., Fort Worth, plans by A. B. Withers, American Fidelity Bldg., Senior High and Elementary School addns. $689,000.

† Tex., Harlingen—TRAINING CENTER—U. S. Govt., c/o Dist. Eng., Room 713, Santa Fe Bldg., Galveston, design of USAR Training Center. $350,000. Ricciuti Assocs. & Gullatt, Lodal & Assocs., 521 Royal St., New Orleans, La., consult. engrs.

Tex., Lamesa—SCHOOL—Lamesa Independent School Dist., Lamesa, plans by Allen & Allen, Lamesa, Rogers Elementary School. $350,000. CD 1/2/51.

Tex., Lyford—AUDITORIUM—Lyford Ind. School Dist., Lyford, A. R. Lezell, supt., auditorium and remodeling bldg. $350,000.

▲ Tex., McAllen—SCHOOLS—McAllen Independent School Dist., McAllen, plans by Zeb Rike, archt., c/o M&J Bldg., and J. B. Hancock, McAllen, South Side Junior High School, $400,000. lower grades classroom addns., $500,000; upper grades classrooms addns., $500,000. CD 10/31.

▲ Tex., McKinney—SCHOOL—McKinney Independent School Dist., McKinney, plans by Fred Buford, Interurban Bldg., Dallas, Junior High School unit, $750,000; Senior High School unit, $880,000; elementary school unit, $450,000. CD 3/26.

Tex., Mineral Wells—SCHOOL—Mineral Wells Independent School Dist., H. M. Carnes, supt., Box 13, plans by Wilson, Patterson & Assocs., 601 Bailey St., Fort Worth, group school bldg. addns. $730,000.

▲ Tex., San Antonio—HOUSING—San Antonio Housing Auth., 400 Laor St., plans by Marmon-Mok Assocs., South Texas Bldg., archts. and Noonan, Thompson & Krocker, 2002 N. St. Mary, archts. and consult. engrs., 115 unit "Golden Age Center" for elderly people, (Tex. 6-18) $2,000,000. CD 10/24/49.

Tex., Ysleta—SCHOOL—Ysleta Independent School Dist., Ysleta, plans by Carroll & Daeuble, 1001 E. Yandell Blvd., El Paso, elementary school, (Tex. 56-C-2-E6). $350,000.

Utah, Salt Lake City—SCHOOL—Granite School District, 3212 South State St., plans by Barker Engineers & Architects, 270 South 12 St. East, Junior High School, 3900 South 9 St. East. Over $400,000. CD 2/14.

▲ Utah, Spanish Fork—SCHOOLS—Nebo School Dist., Wallace Brockbank, supt., Spanish Fork, 2 elementary schools. $1,500,000.

▲† Va., Fort Myer—HOUSING—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., plans by John H. Graham, 2430 Pa. Ave. N.W., Wash., D. C., and Milton J. Prassas, 5915 Massachusetts Ave. N.W., Wash., D. C. 188-unit Capehart Housing, $3,000,000-$5,000,000. Bids in August.

▲ Wash., Camas—SCHOOL—School Dist. 117, Camas, plans by Freeman, Hayslip, Tuft & Hewlett, 2040 S. W. 3 Ave., Portland, Ore., high school. $1,000,000. Bids next month. CD 5/16.

Wash., Naselle—HIGH SCHOOL—School Dist., 129-130, Naselle, bond election May 18, high school, $425,000,000. CD 11/14.

Wash., Pasco—CLASSROOM BLDG., etc.—School Dist. No. 1, Pasco, plans by W. L. Wulff, 1526 W. Riverside St., Spokane, 40,000 sq. ft. classroom bldg. $450,000; 34,000 sq. ft. music and gymnasium bldg. $400,000 for Columbia Basin Junior College. Bids July 1.

Wash., Seattle—SCHOOL—Shoreline School Dist. No. 412, E. 158 St. and 20 Ave. N.E., plans by Young, Richardson & Carleton, Central Bldg., Highland Terrace Elementary School, N. 160 St. and Greenwood Ave. $450,000.

▲ Wash., Walla Walla—MAXIMUM SECURITY, etc.—State Dpt. P. Institutions, Olympia, plans by J. W. Maloney, Central Bldg., Seattle, Zone 4, maximum security and reception bldg. and cell block, State Penitentiary. $2,000,000. Bids this summer. CD 2/13/56.

† Alaska, Juneau—LABORATORY—U. S. Fish & Wildlife Service, Interior Bldg., 19 and C St. N.W., Wash. 25, D. C., 13,000 sq. ft., rein.-con. fishery research laboratory. $400,000.

Ont., Kingston—MEDICAL SERVICE, etc.—Queen's University Bd. Trustees, Kingston, plans by Drevor & Smith, 81 Brook St., 3 story, bsmnt., 60x230 ft., steel, rock-faced random squared limestone exterior walls Medical Service and Research Bldg., Queen's University Hospital Bldg., concrete fdns. Over $350,000. P. T. Mikluchin, c/o John B. Parkin & Assocs., 1500 Don Mills Rd., P. O. "J", Toronto, consult. engrs.

Ont., Picton—SCHOOL—Prince Edward District Collegiate Institute Bd., c/o Drevor & Smith, archts., 81 Brock St., Kingston, school, $600,000. P. T. Mikluchin, c/o John B. Parkin & Assocs., 1500 Don Mills Rds., P. O. "J", Toronto, consult. engr.

COMMERCIAL BUILDINGS

▲ Ariz., Scottsdale — CO-OPERATIVE APARTMENT — Scottsdale Braemar Apartments, Inc., Scottsdale, plans by Hiram Hudson Benedict, 4523 N. Scottsdale Rd., 90-unit co-operative apartments incl. twenty-one 1 and 2 story buildings. $2,500,000.

▲ Calif., Modesto—DEPARTMENT STORE—Joseph Magnin Co. Inc., Stockton and O'Farrell Sts., San Francisco, plans by L. Smith & Assocs., Santa Rosa, 2 story, wood frame, 15,000 sq. ft., lath and plaster constr. department store at McHenry Village Shopping Center. $2,000,000.

Calif., Palmdale—DWELLINGS—Griffin Constr. Co., 222 Avenida Del Norte, Hollywood Riviera, plans by Young & Remington, 318 Vista Del Mar, Redondo Beach, 57 frame, stucco dwellings, Palmdale Ave. $570,000.

Conn., Bridgeport—OFFICE—Willimantic Investor Co., c/o A. H. Pokras, archt., 2875 Main St., 3 story office bldg. $350,000. CD 5/9.

Conn., Middletown—HOUSES—Veggo F. Larsen Co., 405 Temple St., New Haven, 70 houses, Long Hill, $700,000.

Conn., New Haven—RESEARCH WING—Yale University, 119 College St., plans by Douglas Orr, 111 Whitney Ave., 4 story, 55x100 ft. research wing, Sterling Hall of Medicine, Cedar St. $800,000. CD 12/19.

▲ Conn., North Branford—HOUSES—White Hollow Estates, North Branford, 152 houses. $1,520,000.

Conn., South Windsor—BOWLING ALLEY, etc.—A. M. F. Pinspotters, Inc., 261 Madison Ave., New York, N. Y., bowling alley and restaurant, Maguire Rd., 40 Big-Pin Alleys, $500,000.

▲ D. C., Wash. — SCHOOL OF FOREIGN SERVICE — Georgetown University, 37 and O Sts. N.W., plans by Murphy & Locraft, 1518 P St. N.W., School of Foreign Service, $2,000,000. CD 10/26/53.

▲ Fla., St. Petersburg—OFFICE, etc.—Suncoast Bldg. Corp. of New York, c/o Glenn C. Johnson, archt., 800-49th St. N., 14 story, office bldg., stores and offices, parking within the structure, 5th St. and 1st Ave. $3,000,000. CD 2/13.

Ill., Chicago—CHURCH—All Saints Church, 10809 S. State St., plans by Stasys Kudokas, 17012 Dorchester Rd., Cleveland, O., church, 10801 S. State St. $450,000.

Ill., Chicago—COMMUNITY CENTER—Chicago Boys Club, 123 W. Madison St., plans by Perkins & Will, 309 W. Jackson Blvd., community center and swimming pool, 944-56 Gunison St. $800,000.

▲ Ind., Fort Wayne—HOSPITAL—Bd. Trustees Parkview Memorial Hospital, 2200 Randalia St., 3 story top addn., central and west wings, 2 story adjoining addn. $1,250,000.

Ind., Fort Wayne—CHURCH—Calvary Temple, Inc., Rev. Paul E. Paino, 1119 Maumee Ave., 1 and 2 story, brick, stone church, N. Clinton St. near Grove St. Over $400,000.

▲ Ind., Indianapolis—APARTMENT—Emma B. Herd, 3947 N. Meridian, 5 story apartment in 3900 block of North Meridian St. $1,000,000.

Ind., Indianapolis—SCHOOL, etc.—Trinity Evangelical Lutheran Church, 1435 E. Market St., plans by B. R. Gebhart, 203½ S. Main St., Celina, O., masonry, structural steel, concrete elementary school and gymnasium, $400,000. CD 6/29.

▲ Iowa, Estherville—HOSPITAL—Holy Family Hospital, Estherville, plans by Hills, Gilbertson & Hayes, 6009 Wayzata Blvd., Minneapolis, Minn., hospital addn. $1,300,000. Bird, Bird & Assocs., Osseo, Minn., engrs. CD 12/20.

Me., Brunswick—DORMITORY—Bowdoin College, John Brush, supt. Grounds & Bldgs., Rhodes Hall, plans by McKim, Mead & White, 101 Park Ave., New York, N. Y., men's dormitory. $350,000.

Md., Bethesda—SCHOOL—Stone Ridge Convent of Sacred Heart, 9101 Rockville Pike, plans by Murphy & Locraft, 1518 P St. N. W., Wash., D. C., school. $600,000.

Mass., Boston—HOSPITAL—Children's Cancer Research Foundation, 35 Binney St., plans by Leland, Larsen, Bradley & Hibbard, 711 Boylston St., hospital addn., 35 Binney St. $500,000. Constr. in 1957.

Mass., Cambridge—DORMITORY—Harvard College, Cambridge, plans by Shepley, Bulfinch, Richardson & Abbott, 1 Court St., Boston, dormitory, Mt. Auburn, DeWolfe and Plympton Sts., $400,000. Constr. in 1957. CD 2/21.

Mass., Gardner—HOSPITAL—Henry Heywood Memorial Hospital, 242 Green St., plans by Ellerbe & Co., First National Bank Bldg., St. Paul, Minn., 3 story hospital addn. $350,000. Constr. in 1957.

▲ Mass., South Lancaster—DORMITORY, etc.—Atlantic Union College, South Lancaster, plans by John D. Lattimer, Depositors National Bank Bldg., Durham, N. C., men's dormitory, swimming pool. $5,000,000. Constr. in 1957. CD 6/7/44.

▲ Mass., Worcester—SCIENCE—Holy Cross College, College St., plans by C. W. Buckley, Inc., 311 Main St., brick science bldg. $1,250,000. Constr. in 1957. CD 10/5/45.

Minn., Minneapolis—HOSPITAL—Glenwood Hills Hospital, 3901 Golden Valley Rd., plans by M. Abbott, 240 Foshay Tower, 3 story, ground floor, 43x150 ft. hospital addn. $500,000. Bids soon.

Minn., Richfield (P. O. Minneapolis)—CHURCH—Richfield Lutheran Church, Rev H. T. Rasmussen, W. 58 St. and Wentworth Ave., plans by Bergstedt & Hirsch, 2706 W. 7 St., St. Paul, 1 story, 30,000 sq. ft. church, Nicollet Ave. and Sixtieth St. $500,000. Constr. in 1957-1958.

Mo., Crestwood (St. Louis 23 P. O.)—STORE—Boyd's, Ingram F. Boyd Jr., pres., 602 Olive St., St. Louis, Zone 1, 2 level 22,000 sq. ft. store in Crestwood Plaza area U. S. No. 66, near Sappington Rd. $350,000.

Mo., St. Louis—CLUB—Boys' Club of St. Louis, Harry T. Bussmann Jr., pres., 327 S. 14 St., plans by Raymond F. Maritz & Sons, Inc., 721 Olive St., Zone 1, brick Boys' Club, 11 St. between Sidney and Victor Sts. $300,000. CD 6/25/54.

▲ Neb., Blair—BUILDINGS—Dana College, Blair, buildings. $1,000,000.

N. H., Concord—BUILDING—United Life & Accident Insurance Co., 2 White St., plans by Lyford & Magenau, 10 Fayette St., 3 story, 30,000 sq. ft. building addn. $350,000. Constr. in 1957.

N. J., Kearny—HOSPITAL—West Hudson Hospital, 206 Bergen Ave., plans by Ziegler Childs & Paulsen, 921 Bergen Ave., Jersey City, hospital addns. Bergen Ave. $350,000.

N. J., Maple Shade—MOTEL, etc.—Lewis & Lewis Corp., 1421 Atlantic Ave., Atlantic City, plans by Cox & Guttman, 709 Market St., Camden, motel, pool, $350,000. Bids in April.

N. J., Montclair—CHURCH—First Evangelical Lutheran Church, Montclair, church, Park St. $344,000.

N. Y., Annandale-on-Hudson—DORMITORY—Bard College, Annandale-on-Hudson, women's dormitory, $416,000.

▲ O., Mayfield Heights—SHOPPING CENTER, etc.—Midwest Builders, 2199 S. Green Rd., Cleveland, Zone 21, shopping center, off Mayfield Rd. between Woodrow and Parker Rds., $3,000,000; 160 homes on Queens Park and Indiana Ave. $3,381,000; 50 homes on Commonwealth Rd., $1,050,000. Jos E. McSteen, 13947 Cedar Rd., Cleveland, Zone 18, consult. engr.

O., Silver Lake—CLUBHOUSE, etc.—Crystal Park Development Corp., Silver Lake, clubhouse and golf course on north side of Graham Rd. $500,000.

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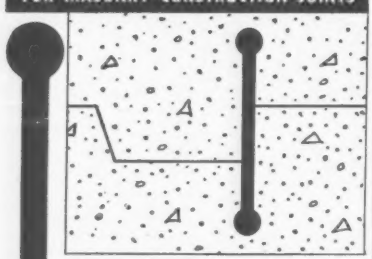

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Pa., Aliquippa—SHOPPING CENTER—Aliquippa Shopping Center, Inc., Standard Life Bldg., Pittsburgh, plans by Frank H. Recco, 101 Marlboro Dr., New Kensington, 1 story, brick, block shopping center, $400,000.

Pa., Kittanning—CHURCH—St. Mary's R.C. Church, High St., plans by Dattola & Ruscitto, Investment Bldg., 239 Fourth Ave., Pittsburgh, 1 story, bsmnt., church. $350,000.

Pa., Greensburg—DEPARTMENT STORE—A. E. Troutman Co., Greensburg, plans by P. A. Bartholomew, 301 Coulter Bldg., Greensburg, 3 story, bsmnt., department store addn., alteration. $350,000.

Pa., Meadville—HOSPITAL—Spencer Hospital, Meadville, 3 story hospital addn. $500,000.

▲ Pa., Phila.—STUDENT UNION—LaSalle College, 20 St. and Olney Ave., plans by Carroll Grisdale & Van Allen, 204 W. Rittenhouse Square, student union bldg. $1,075,000. Severud, Elstad & Krueger, 415 Lexington Ave., New York, N. Y., engrs. CD 4/6/56.

Tex., Amarillo—MOTEL UNITS—Holiday Inn, Affiliated, Park Plaza Motels, Ltd., c/o Lee Stroud, Waco, 50 addnl. brick, masonry motel units, central heating and air conditioning. $350,000.

▲ Tex., Dallas—HEADQUARTERS—Southern Baptist Convention, c/o Relief & Annuity Bd., c/o Baptist Bldg., Ervay and San Jacinto Sts., 6 story headquarters bldg. $1,600,000.

▲ Tex., Houston—SHOPPING CENTER—Belway Community Shopping Center, c/o S. Hogan, Sr. & Oscar Holcombe, 1st National Bank Bldg., plans by Irving R. Klein & Assocs., 1317 Austin St., shopping center in Southeast Houston. $1,000,000.

Tex., Port Isabel—LUXURY LODGE—Padre Island Surf Club, c/o Dr. J. A. Hockaday, mayor, plans by Lee Stuart, 1101 Currie St., Fort Worth, luxury lodge and resort. $350,000. CD 9/27.

Tex., Houston—APARTMENTS—J. D. Fooshee & W. L. Kilgore, Jr., c/o S. M. Shackelford & Assocs., archts., 3767 Richmond Ave., four 2 story pink brick exterior apartments, incl. swimming pool. $350,000.

Tex., Houston—CHURCH—St. George Orthodox Church, c/o Ralph Abercia, Citizens State Bank Bldg., steel frame, church, site at Bissonnet and Mercer Sts. $350,000.

Tex., Odessa—SHOPPING CENTER—Gaze & Cochran, 115 E. 45th St., Odessa, and Jas. Doss, Weatherford, Plans by NeSmith, Lane & Kuykendall, 609 E. Yandell Blvd., El Paso, shopping center, E. County Rd. and E. 42nd St. $800,000.

▲ Tex., Pasadena—SHOPPING CENTER—Greater Downtown Pasadena Assn., c/o Doughtie & Porterfield, archts., 817 S. Tatar St., shopping center 4 blocks wide, 6 blocks long. $17,000,000.

Tex., San Antonio—DWELLINGS—E. J. Burke & Sons, 1100 Goliad Rd., 30 dwellings, off Kate, Schenk and Anton Ave., $365,000; 28 dwellings in the "Highlands" $359,500.

Tex., San Antonio—DWELLINGS—Gilbert Kinder Co., "Kinder Homes", 747 W. Sunset Rd., 38 small frame-type dwellings off Ridgeview St., $362,000; 29 dwellings, in Alamo Heights Gardens, $348,100.

Tex., San Antonio—DWELLINGS—Robert Ross, 1360 W. Poplar St., 35 frame dwellings, off West Ave. $350,000.

Wash., Walla Walla — SCHOOL — Catholic Diocese of Spokane, S 317 Howard St., Spokane, plans by Culler, Gale, Martell & Norrie, Realty Bldg., Spokane, high school. $500,000.

Wis., Beloit—CHURCH, etc.—First Methodist Church, 511 Public Ave., plans by Knodle & Baucom, State Theatre Bldg., 320 State St., church and education unit. $750,000. Raising funds.

Wyo., Cody—EXHIBITION—Buffalo Bill Memorial Assn., Cody, plans by Tressler & McCall, 1276 Sheridan Ave., building to exhibit American, Western Art. $350,000. CD 3/25.

▲ Ont., Brooklin—HOUSING—Owner, c/o D. Satok, 1794 Danforth Ave., Toronto, 700-unit housing program. Over $3,000,000.

▲ Ont., Toronto—SEMINARY—Jesuit Fathers, 403 Wellington St. W., preliminary sketch prepared by Watt & Tillmann, 343 Richmond St., London, seminary, in Oakville area. $2,500,000.

Ont., Toronto—APARTMENT—Marshall Development Co., 17 Mill St., York Mills, Toronto suburbs, plans by Crang & Boake, 79 Huntley St., apartment, 169 St. George St. Over $350,000.

INDUSTRIAL BUILDINGS

▲ Ala., Bessemer—PLANT—Natco Corp., 327 5 Ave., Pittsburgh, Pa., clay conduit mfg. plant. $2,100,000.

▲ Ark., Foreman—CEMENT PLANT—Arkansas Louisiana Gas Co., 300 W. Capitol St., Little Rock, cement plant. $15,000,000. Owner will form new company.

Conn., New Haven—WAREHOUSE, etc.—New Haven Plumbing Supply Co., 221 Water St., plans by Harry S. Cannici, 113 First Ave., West Haven, warehouse, office, 78,000 sq. ft. 1 story, 200x90 ft. wing 40x121 ft. mezzanine, 24x131 ft. steel frame, face brick and concrete block, steel sash in New Boulevard Industrial Park, $780,000. CD 3/29.

Conn., Stamford—PLANT—Graphic Color Plate Co., 72 Worth St., plans by Massari & Raymond, 65 South St., plant. $190,000.

▲ Fla., Miami—WAREHOUSE, etc.—A & P Food Stores, Southern Div. Office, 2198 Beaver St., Jacksonville, warehouse and retail supermarket, NW 62nd St. and 32nd Ave. $2,000,000.

(Continued on page 162)

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Continued from page 160

▲ **Ill., Lincoln**—PLANT—Cutler-Hammer, Inc., 315 N. 12 St., Milwaukee, Wis., mfg. plant. $4,000,000.

Iowa., Ida Grove—FEED MILL—Consumers Co-operative Assn., 318 E. 10th Ave., Kansas City, Mo., feed mill, $350,000.

Mo., Joplin—PLANT—Pacific Mercury Television Mfg. Corp., 13 and Maiden Lane, plant addn. $200,000.

Neb., Omaha—WAREHOUSE—Consumers Co-operative Assn., 318 E. 10 St., Kansas City, Mo., branch warehouse, 69 and L Sts. $150,000.

N. H., Laconia—PLANT—Scott & Williams, Inc., Laconia, 2 stor, 50,000 sq. ft. plant addn. $500,000. Constr. in Spring.

N. J., Princeton—LABORATORY—Daystrom, Inc., 200 Elmora Ave., Elizabeth, electronics research laboratory, $344,000.

N. J., Woodbury—PLANT—Polyrex Chemical Co., Woodbury, plans by Thomas J. Malone, Westville, plant addn. $100,000. Norman Cox, Haddon Heights, engr. Bids in May. CD 3/20.

▲ **N. Y., Fairport**—PLANT—Rochester Mfg. Co., 100 Rockwood St., Rochester, 1 story, 100,000 sq. ft. masonry plant, 67 acre site on Turk Rd. $1,500,000.

O., Alliance—RESEARCH CENTER—Babcock & Wilcox, 161 E. 42 St., New York, N. Y., research center at plant. $150,000. CD 8/27/46.

O., Toledo—WAREHOUSE—Pittsburgh Plate Glass Co., 2410 Albion St., warehouse on 4½ acre site on south side of Nebraska Ave., next to Toledo Terminal R.R., near Hill Ave. Over $100,000.

▲ **Pa., Pittsburgh**—GARAGE—Hotel Webster Hall, 4415 Fifth Ave., plans by Design, Inc., 906 Sidney St., St. Louis, Mo., parking garage. $1,000,000.

▲ **Tenn., Erwin**—PLANT—Davison Chemical Div., W. R. Grace & Co., 3 Hanover Square, New York 4, N. Y., plant to produce uranium, thorium and rare earth alloys.

Tex., Dallas—RESEARCH, etc.—Universal Corp., 6710 Denton Dr., research, engineering, manufacturing bldg., on 18 acre site $150,000.

▲ **Tex., Dumas**—PLANT—Shamrock Oil & Gas Co., 1st. National Bank Bldg., Amarillo, plant expansion for production sulphuric acid, $1,500,000; aromatic extraction unit for recovery of Benzine, Toluene and Xylene from Platinum Reforming unit stream, $1,000,000.

Tex., Houston—TRUCK TERMINAL—Brown Express Co., [illegible] truck terminal, 7.6-acre site, off Irvington Blvd. and Weiss St. $500,000.

Tex., Houston—INDUSTRIAL—Chicago Bridge & Iron Co., 5625 Clinton Dr., industrial bldg. site, northwest of city limits. $500,000.

Tex., Houston—WAREHOUSE, etc.—Glazers Wholesale Drug Co., 3202 Harrisburg St., plans by George Edwards, 1509-A Cochran St., Dallas, warehouse, 40,000 sq. ft. paving area. $150,000.

Tex., Houston—PLANT—Bogle Steel & Pipe Co., 120 Heights Blvd., plant, northwest city limits, $250,000.

Tex., Houston—PLANT FACILITIES—Milwhite Mud Sales Co., c/o M&M Bldg., plans by Milton McGinty, 2425 Ralph St., plant facilities, incl. office area. $200,000.

Tex., Houston—MANUFACTURING PLANT—United Fabricating Co., 4619 Eigel St., mfg. plant, northwest city limits. $250,000.

Tex., Jacksonville—WAREHOUSE—Three Beall Bros., Jacksonville, plans by Melvin J. Cates, 902 Bryant Petroleum Bldg., Tyler, 168x200 ft., masonry, steel warehouse, $245,000.

Tex., Odessa—AUTO AGENCY, etc.—Broncho Chevrolet Co., Odessa, plans by Leonard F. Crockett, 506 N. Lincoln St., 45,000 sq. ft., steel haydite block auto agency, display, sales, shops. $300,000.

Tex., San Antonio—WAREHOUSE—Wilson Joint Stock Assoc., 727 N. Salado St., warehouse, $150,000. Central Forwarding Co., lessee. Mervin G. Beavers, 3808 Bailey Lane, Austin, consult. engr.

Tex., Woodville—PLANT—Houston Poultry & Egg Co., 1917 Houston St., poultry processing plant, 7-acre site in Hyde Addn. $150,000.

Ont., Toronto—PLANT—Kendall Co. (Canada) Ltd., Curity Ave., 40,000 sq. ft. plant addn. $350,000. Proctor, Redfern & Laughlin, 11 Jordan St., consult. engrs.

Que., Shawinigan Falls—WAREHOUSE—Robert Bourassa, Inc., 902 Ave. Cascade, Shawinigan Falls, 2 story, 60x300 ft., concrete, wood warehouse, Cascade Ave. $150,000.

UNCLASSIFIED

▲ **Ariz., Phoenix** — PARKS, etc. — City, City Hall, $4,800,000 bond election May 7, parks and playground.

Conn., Manchester—BATHHOUSE, etc.—Town plans by Scuderi & Mankey, 866 Center St., bathhouse, repairs to bldg., modernize swimming pool, concession stand, showers, etc. Spring St. $135,000. CD 3/26.

Iowa—RURAL DISTRIBUTION LINES—Pella Co-operative Electric Assn., Pella, distr. lines, tie lines, system imprvs., transmission line, transformers, and line conversion, Marion Co. $320,000. REA loan approved. Brown Eng. Co., 322 K P Bldg., Des Moines, consult. engr. CD 3/21.

Nebraska—RURAL DISTRIBUTION LINES—Polk County Rural Public Power Dist., Stromsburg, distr. lines, sys. Imprvs., sub-station, constr., line conversion, Polk Co. $417,000. Henningson, Durham & Richardson, 2962 Harney St., Omaha, consult. engrs. CD 4/6/55.

N. J., Allendale—DRIVE-IN THEATRE—Edw. and Lawrence P. Marron Co., 55 Franklin Ave., Ridgewood, plans by Malkind Curlitz, Pearl River, N. Y., drive-in theater on Rte. 17. $500,000.

Ohio—RURAL DISTRIBUTION LINES—Buckeye Rural Electric Co-operative, Gallipolis, 50 mi. rural distr. lines and sys. Imprvs., Gallia Co. $880,000. CD 1/8/53.

O., Irondequoit—SWIMMING POOL, etc.—City, City Hall, plans by Faragher & Macomber, 900 Powers Bldg., Rochester, N. Y., swimming pool, skating rink, auditorium, bath house, facilities, etc. $700,000-$1,000,000.

▲ **Ore., Portland**—SPORTS AND CONVENTION CENTER—City, City Hall, plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., sports and convention center, 20 acre site across Willamette River. $8,000,000. To start in 1958. CD 12/29/53.

Pa., Wayne—SWIMMING POOL—Martin's Dam Club, 150 Willowburn Rd., Villanova, plans by Charles Whitaker, Lancaster Ave., 3 swimming pools, $150,000.

▲ **Texas**—ELECTRIC GENERATING PLANT, RURAL DISTR. LINES, etc.— Cap Rock Electric Co-operative, c/o O. B. Ryan, mgr., Stanton, and Lynntegar Electric Co-operative, Taloka, c/o Garland Pennington, mgr., electric generating plant. $11,000,000, electric power sub-station $2,000,000, between Stanton and Taloka; 66 KV Transmission lines, $2,000,000. Stanton and Taloka areas.

Texas—GAS LINES—Phillips Petroleum Co., Bartlesville, Okla., 30 mi. 3 to 8 in. gas lines, Moore, Sherman, Hansford, Hutchinson and Gray Counties. $145,000.

Tex., Amarillo—PARK—City of Amarillo and Potter Co., Amarillo, city-county park, (water system, 9-hole golf course, road work) $100,000; city-county park imprvs. (swimming pool; picnic area; zoo) $100,000.

Tex., Houston—MAUSOLEUM—Owners, c/o H. R. Winslett & Hugh E. Gragg, archts., 3927 Essex Lane, mausoleum with 540 marble front crypts, and crematorium, $250,000.

[illegible] **Pa.**—City, City Hall, voted bonds Mar. 23, parks, $275,000.

Tex., Pasadena—PARKING AREA—Greater Downtown Pasadena Assn., c/o Doughtie & Porterfield, archts., 817 S. Tatar St., large hard-paved parking area. $200,000.

Wash., Anacortes—SWIMMING POOL—Community Action, c/o V. Weber, Anacortes, swimming pool, $147,000. CD 6/23/50.

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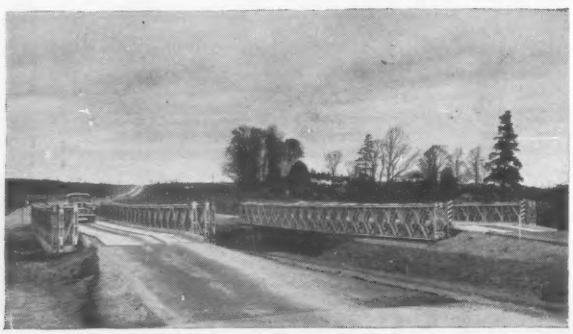

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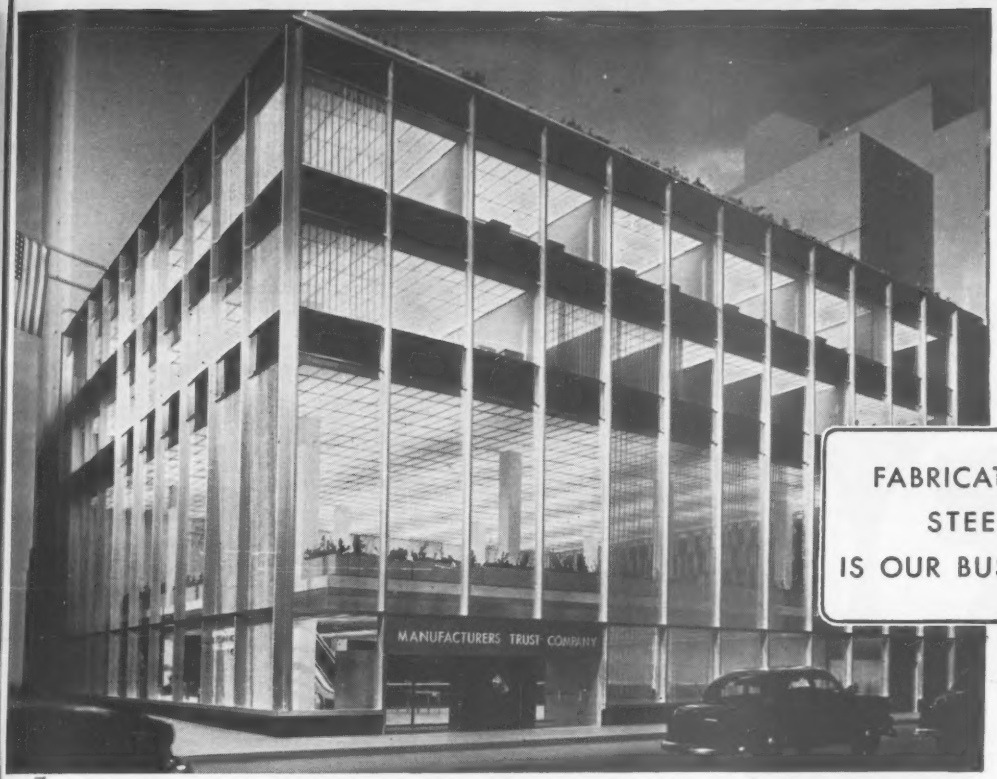

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STANDING PROOF OF INGALLS' SKILL

On New York's famous Fifth Avenue, the Manufacturer's Trust Company has, today, one of the country's finest, most modern bank buildings . . . brilliantly unique even in that city of great buildings. A five-story structure of sparkling plate glass and lustrous aluminum . . . with a backbone of steel. The structural steel was fabricated by The Ingalls Iron Works Company and erected by The Ingalls Steel Construction Company.

Thousands of commercial and industrial buildings are standing proof of Ingalls skill and ability to meet any steel requirement, regardless of size or location.

Ingalls can serve you better . . . for complete information regarding *why* and *how*, write:

INGALLS' PLANTS GREATLY EXPANDED

Capacity has been increased nearly 70% at all Ingalls' Plants within the past three years . . . part of a program designed to give Ingalls the facilities to meet every modern requirement for fabricated structural steel for any construction purpose.

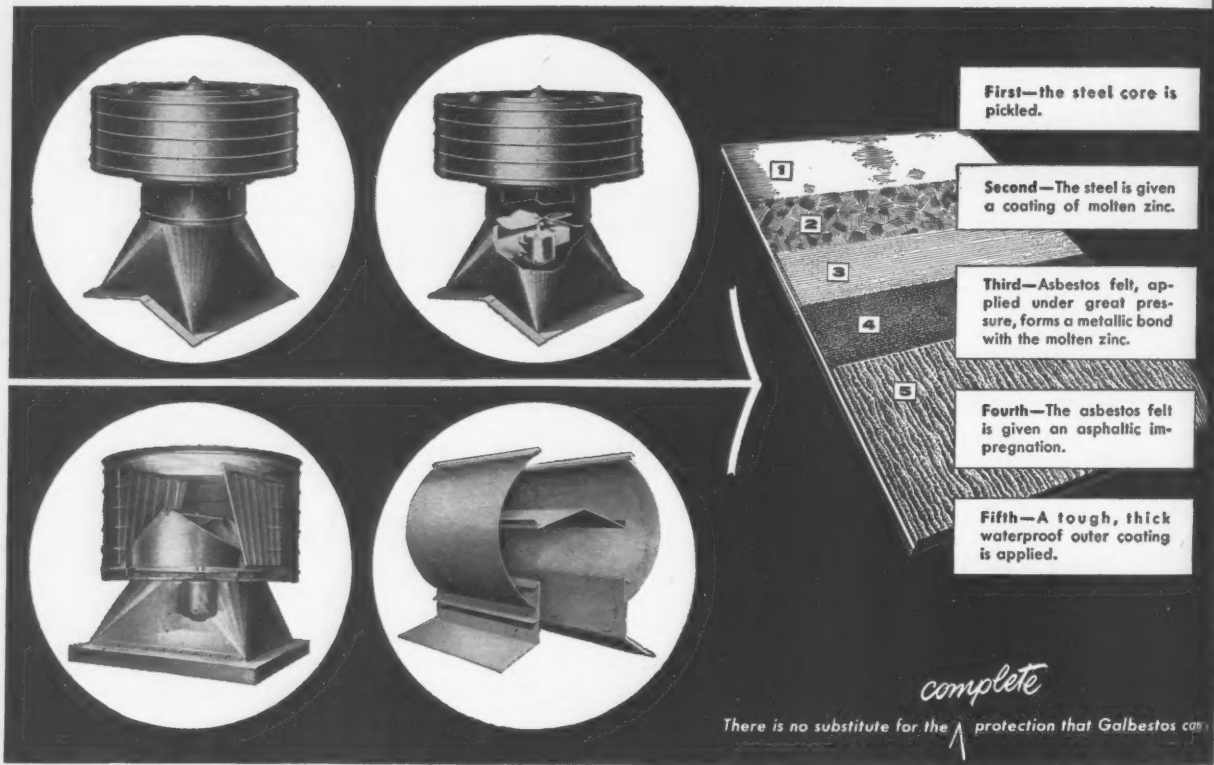
THE INGALLS IRON WORKS COMPANY
Established 1910
BIRMINGHAM, ALABAMA
Plants: Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Decatur, Ala., Pascagoula, Miss.

FABRICATED STEEL for Power Plants • Hangars • Stadia • Stores • Bridges • Office Buildings • Theatres • Hotels • Apartment Houses • Hospitals • Churches • Schools • Industrial Buildings • Tanks • Bins • Pressure Vessels • Stacks

An Unbeatable Combination

ROBERTSON VENTILATORS made from ROBERTSON GALBESTOS

You will design years of maintenance free servic into your buildings by using either round or type Robertson Ventilators made of Galbestos. V lators are potentially the points of greatest co in a building because of their exposure to corr from outside and from within and the difficult keeping them painted. Robertson Galbestos V lators require no painting, and will last as long a roof and walls—*where Robertson has long bee world's standard.* The use of Galbestos in their m facture enables Robertson Ventilators to withs extreme weather and highly corrosive industrial f over long periods without maintenance.


First—the steel core is pickled.
Second—The steel is given a coating of molten zinc.
Third—Asbestos felt, applied under great pressure, forms a metallic bond with the molten zinc.
Fourth—The asbestos felt is given an asphaltic impregnation.
Fifth—A tough, thick waterproof outer coating is applied.
1
2
3
4
5
complete
There is no substitute for the protection that Galbestos can

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H. H. ROBERTSON COMPANY

2420 Farmers Bank Building, Pittsburgh 22, Pa.

In England—Robertson Thain Ltd., Ellesmere Port, Cheshire
In Canada—Robertson-Irwin Ltd., Hamilton, Ontario

As shown in the cutaway illustration above, Galbe employs a unique means of bonding the mult coatings to the metal core. This exclusive metho manufacture produces a tough, corrosion-resist and weather-resistant roofing and siding mate which provides long service life without maintena of any kind. You get complete protection—las protection and efficient ventilation—when you spe Robertson Ventilators made of Galbestos.

The economical value of Robertson Ventilators not only in their long range qualities of durabi and maintenance freedom, but also in their exclu design and construction features. When they are stalled according to a Robertson Engineered Ve lation Recommendation, you will obtain effici ventilation with the fewest number of units . resulting in lower cost. For complete details a engineering assistance, send in the coupon.

Please send information on Robertson Ventilators.

NAME_____

COMPANY_____

ADDRESS_____

...S—Low Bids—Contracts—Second Section

...W ENGLAND

...Y CONSTRUCTION—BA

...rmont—BA 4/23—U. S. Eng., 150 Causeway St., ...on, Mass., Ball Mountain Dam, etc., West River, ...ica-Londonderry, Windham Co., CIVENG-19-016-...3. Over $5,000,000. Extended date. CD 3/20.

...DINGS—BA

...., Norwich—INTENSIVE TREATMENT—BA 5/8 ...nn. State P. Wks. Dpt., 165 Capitol Ave., Hart- ... Proj. BI-K-102, intensive treatment bldg., Nor- ... State Hospital. $5,300,000. Plans deposit $40. ...12/18.

...VY CONSTRUCTION—LB & CA

...ite Oak Excavators, Inc., 61 Main St., Plain- ..., Conn. CA $2,349,249. roadway approaches ... Wolcott Ave. crossing over Connecticut River, ...rox. 8,026 lin. ft. grading, drainage, etc., incl. ...prestressed concrete girder grade separation struc- ..., South Windsor and Windsor, HARTFORD, ...n. Hartford Bridge Auth., 71 Capitol Ave., ...tford, Conn. Bids Mar. 25. CD 3/27, under LB.

...LDINGS—LB & CA

...hite Constr. Co., 376 Boylston St., Boston, Mass. ... $1,758,000. East JUNIOR HIGH SCHOOL, ...OCKTON, MASS. City, City Hall, Brockton, Mass. ...s Apr. 2. CD 3/18.

...easant Valley Estates, Meadow Rd., South Windsor, ...n., CA $4,875,000. 300 HOUSES, Pleasant Valley ...tates, Pleasant Valley Rd., SOUTH WINDSOR, CONN. ...arded Mar. 22. CD 2/1/56.

...DDLE ATLANTIC

...VY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

...l 23 Maryland — May 3 Pennsylvania

STREETS AND ROADS

...l 30 New Jersey — May 3 Pennsylvania

...AVY CONSTRUCTION—LB & CA

...Great Lakes Dredge & Dock Co., 17 Battery Place, ...w York 4, N. Y. LB $1,802,565 est. $1,477,774. ...2 bidders) dredging and rock removal to depth of ... ft. below mean low water from New York and ...w Jersey channels Sect. 4 Rock Area 11 Middlesex ...nal Union Counties, N. J., and Richmond Co., N. Y., ...IVENG 30-075-57-67, NEW YORK AND NEW JER- ...EY. U. S. Eng., 111 E. 16 St., New York 3, N. Y. ...D 3/22.

...ILDINGS—LB & CA

...CWC Constr. Corp., 105 Court St., Brooklyn 2, N. Y. ...A Est. $3,000,000. 14 story APARTMENT and ...GARAGE 1407 Linden Bld., BROOKLYN, N. Y. Earl ...M. Jimerson Housing Co., Inc., 32 Broadway, New ...York 4, N. Y. CD 2/1.

...James J. Waters Corp., 415 Lexington Ave., New ...York, N. Y. LB $2,414,000. (8 bidders.) HIGH ...SCHOOL, BUS GARAGE, MASSENA, N. Y. Massena ...Central School Dist., No. 1, Massena, N. Y. Bids Mar. ...29. CD 3/19.

...Terminal Constr. Corp., State Hy. No. 17, Wood Ridge, ...N. J. CA $6,154,000. (4 bidders) general constr. two ...13 story BUILDINGS, five 14 story BUILDINGS, JER- ...SEY CITY, N. J. Jersey City Housing Auth., City Hall, ...Jersey City, N. J. Grand total $8,345,982;

...Astrove Plumbing & Heating Corp., 36-14 32 St., Long ...Island City, N. Y. CA $967,000. (4 bidders) plumbing ...work (Jersey City, N. J.);

...E. J. Wohrle, Inc., 15 Bergen Blvd., Fairview, N. J. ...CA $629,982. (3 bidders) heating work, (Jersey City, ...N. J.);

...W. L. Schoonover & Co. and Mayer Elec. Service, 164 ...Emmert St., Newark, N. J. (joint venture) CA $595,000. ...(5 bidders) electrical work (Jersey City, N. J.).

...James McGraw Co., 2043 Eastburn Ave., Phila., Pa. ...LB $2,613,890. SENIOR HIGH SCHOOL, Northampton, ...NORTH ALLENTOWN, PA. Northampton Area Joint ...School Bd., North Allentown, Pa. Bids Apr. 1. CD ...3/18.

...Joseph F. Hughes & Co., 5 E. Franklin St., Baltimore, ...Md. CA $3,041,245. Dundalk SENIOR HIGH SCHOOL, ...Dundalk, TOWSON, MD. Baltimore Co. Bd. Educ., Aig- ...burth Rd., Towson, Md. CD 3/29, under LB.

...OUTH

...EAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

...April 24 Virginia — May 16 Florida

STREETS AND ROADS

...April 24 Virginia — May 16 Florida

...EAVY CONSTRUCTION—LB & CA

...Magazine Brothers, Woodward Bldg., Wash., D. C. Owner Builds. $1,500,000. MOTOR HOTEL, Shirley Hy. and Edsall Rd., FAIRFAX, VA. Corning & Moore, 1302 18 St. N.W., Wash., D. C., archts.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 23 Michigan

STREETS AND ROADS

April 30 Ohio

▲† Illinois—BA On Or About 5/25—U. S. Eng., 475 Merchandise Mart, Chicago, Zone 54, widening third section approx. 4 mi. Calumet-Sag Channel, Serial No. CIVENG-11-032-57-36. CD 6/30/55.

HEAVY CONSTRUCTION—LB & CA

▲ ILLINOIS—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

ISTHC—Hedges Constr. Co., 100 N. La Salle St., Chicago, Ill., and Ryan Bros. Co., Janesville, Wis., LB $5,677,957, Cont. T-2-A, grading, drainage, paving, appurtenances, precast, concrete, structural steel bridges 2.59 mi. from N.E. of Midlothian to point N.W. of 13 St. and Crawford Ave. in Alsip, Cook Co.;

ISTHC—Contracting & Material Co., 1235 Dodge St., Evanston, Ill.; Kenny Constr. Co., 3200 Oakton St., Skokie, Ill. and Louis Garavaglia, Centerline, Mich., LB $11,334,400. Cont. T-5-A, grading, draining, paving, appurtenances, precast concrete, steel bridges 5.4 mi. from intersection of 71 and Wolf Rd. N. of Willow Springs to 31 St. and Cook-Dupage Co. Line N. of Hinsdale, Cook Co. CD 3/15.

▲ ILLINOIS—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago. Bids opened 4/4.

ISTHC—Industrial Constr. Co. of Minneapolis, 20 N. Wacker Dr., Chicago, Ill., LB $1,579,514. Cont. T-1-B, roadway for bridge across Ill. Central freight yards in Makham, exclusive of furnishing, erecting of structural steel 0.335 mi.;

ISTHC—Union Chemical & Materials Corp., 79 W. Monroe St., Chicago, Ill., LB $2,673,959. Cont. PNI-3, mfg. furnishing, del. 96,300 lin. ft. prestressed concrete girders for use in 52 bridges between Aurora and Des Plaines. CD 3/15.

▲ ILLINOIS—Illinois State Toll Hy. Comn., 20 N. Wacker Dr. Chicago, Bids opened 3/21.

Orr Constr. Co., 27 19 Pl., Chicago Heights, Ill., LB $2,246,360. Cont. T-3-B, grading, drainage, paving, appurtenances, precast concrete, steel bridges 1.24 mi. beginning S. of AT and SF R.R. yards extending northerly to N. of 71 St., Cook Co. CD 3/4.

▲ Robert R. Anderson, 4550 W. Patterson St., Chicago, and Hedges Constr. Co., 5915 N. Rogers Ave., Chicago, Ill. CA $1,717,940. Section 1-C-4, main ramps, Calumet Skyway Toll Bridge into Michigan and Indiana Aves. from E. 61 St. to S. Lawrence Ave., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Feb. 6. CD 2/18, under LB.

BUILDINGS—LB & CA

▲ Felmley-Dickerson Co., 1008 N. Goodwin Ave., Urbana, Ill., CA $5,186,947. Men's RESIDENCE HALL, URBANA, ILL. University of Illinois, 256 Administration Bldg., Urbana, Ill. Bids Dec. 20. CD 1/28, under LB.

▲ John Kinzler, 670 Huron St., Pontiac, Mich. Owner Builds. $1,700,000. Colberry Park, 65 brick ranch HOMES, BLOOMFIELD, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 23 Oklahoma — April 25 Montana, Wyoming
April 26, Minnesota, North Dakota

STREETS AND ROADS

April 23 Oklahoma — April 24 Wyoming
April 25 Montana — April 26 Minnesota, North Dakota

BUILDINGS—BA

▲ Tex., Laredo—HOUSING, etc.—BA 4/30—Laredo Housing Authority, c/o Ed. S. Russell, 2000 San Francisco Ave., 200 dwelling units, in 100 separate bldgs., $2,045,600; facilities, site imprvs., streets, curbs, walks, sewers, water, gas, electric, grading, landscaping, etc. $200,000. Proj. TX-11-2. CD 9/18.

▲ Minn., Minneapolis—RESIDENCE HALL—BA 5/8—Regents of the University of Minnesota, C. A. Smith, purch. agt., 404 Admin. Bldg., Zone 14, men's residence hall on campus, $1,600,000. Plans deposit $50. Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, archts. CD 7/31.

HEAVY CONSTRUCTION—LB & CA

▲ MISSOURI—State Hy. Dpt., Jefferson City,

St. Louis County Bridge & Grade Co., 7929 Alabama Ave., St. Louis, Mo. CA $1,427,251. 76 ft. c. conc. 0.956 mi., city of St. Louis. CD 3/11, under LB.

▲ TEXAS—State Hy. Comn., Austin,

Tex.—Cage Bros. & T. C. Cage, 6959 San Pedro St., San Antonio, Tex. CA $1,027,118. flex. base and hot mix. b. conc. 10.287 mi. hy. US 80 Proj. I. 235 (28) Howard Co.; CA $1,636,893. flex base and hot mix b. conc. 2.804 mi. hy. US 81 Proj. I.8 (15) Hays Co.;

Tex.—Austin Road Co., P. O. Box 1590, Dallas, Tex., CA $2,580,746. concrete, asphalt pavt. and 2 crossings, surf. treat 13.504 mi. hy. US 75 Proj. F 98 (10) FG 98 (11) & U. 515 (24) Collins and Dallas Counties;

Tex.—R. W. McKinney, P. O. Box 190, Nacogdoches, Tex. CA $1,198.235. flex. base on b. conc. 6.840 mi. Hy. US 80 Proj. I 526 (14) and I 130 (11) Kaufman Co;

Tex.—Heldenfels Bros., P. O. Box 1917, Corpus Christi, Tex. CA $636,681. and b. conc. 2.243 mi. Hy. SH 9 and U. S. 77, Proj. F. 657 (16) Nueces and San Patricio Counties. Grand total $6,052,555. Bids Mar. 20. Awarded Mar. 28. CD 3/26, under LB.

▲† T. C. Bateson Constr. Co., Box 7305 Inwood Station, Dallas, Tex., LB $2,632,700. 3 story structural steel, 25,676 sq. ft. administration bldg., Air Force Academy, IFB 05-613-57-20, COLORADO SPRINGS, COLO. Dpt. Air Force, Box 1670, Colorado Springs, Colo. Bids Mar. 28. CD 3/7.

▲† T. C. Bateson Co., Box 7305, Inwood Station, Dallas, Tex. LB $6,977,700. cadet physical education bldg., Air Force Academy, IFB 05613-57-21, COLORADO SPRINGS, COLO. Contg. Officer, Air Force Academy Const. Agency, P.O. Box 1670, Colorado Springs, Colo. Bids Apr. 9. CD 3/15.

BUILDINGS—LB & CA

▲ M. Capp Mfg. Co., 1143 Dupont Ave. N., Minneapolis, Minn. Own Forces $3,000,000. INDUSTRIAL CENTER providing warehousing, distribution and light mfg. facilities, Vandali St., 3 blocks north of University Ave., ST. PAUL, MINN. CD 9/14.

▲ M. K. Eby Constr. Co., Inc., 610 N. Main St., Wichita, Kan. LB $5,598,000. general constr. COURT HOUSE, WICHITA, KAN. Sedgwick Co., Wichita, Kan. Bids Mar. 26, CD 3/5;

Ripstra-Turner Co., 1015 E. Douglas St., Wichita, Kan. LB $1,198,432. mechanical work (Wichita, Kan.);

Brown Electric Co., 714 N. Main St., Wichita, Kan. LB $595,190. electrical work (Wichita, Kan.);

Montgomery Elevator Co., 348 N. St. Francis St., Wichita, Kan. LB $357,387. elevator work (Wichita Kan.).

▲† Bajac, Inc., 1101 Mercantile Securities Bldg., Dallas, Tex. CA $2,210,300. 134 HOUSING units, White Sands Proving Ground, (Capehart), ENG-29-005-57-15, LAS CRUCES, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. CD 2/14, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 1, 8, California — May 23 Washington

STREETS AND ROADS

May 1, 2, 8, 9, 15, 22 California

▲ Calif., Los Angeles—BA 5/15—City Council, City Hall, constr. ocean outfall for effluent disposal at Hyperion Treatment Plant, $15,000,000. Extended date. CD 3/18.

▲† Guam, Marianas Islands—POL FACILITIES—BA 6/12—Bureau Yards & Docks, c/o Res. Officer in Charge of Constr., 333 Fell St., San Francisco, Calif., U.S.A., POL hydrant refueling system, NBy 3325, $5,500,000. CD 4/10, under LB.

BUILDINGS—BA

▲ Ore., Portland—HOTEL—Bids Asked—Lloyd Corp. Ltd., 9441 W. Olympic Blvd., Beverly Hills, Calif., 8 story, 300 room Sheraton "Highway Hotel". $5,000,000. Sheraton Corp., lessee. CD 4/29/56. under Sheraton Corp, as owner.

HEAVY CONSTRUCTION—LB & CA

Calif., Mercer, Fraser Co., Inc., and Mercer, Fraser Gas mento, Bids opened 4/10,

Mercer, Fraser Co., Inc., and Mercer, Fraser Gas Co., Inc., 2nd and Commercial Sts., Eureka, Calif., LB $1,803,911, (5 bidders) grading, surfacing 4.2 mi. 4 lane freeway between 0.5 mi. north of Hilvilla and 0.7 mi. south of Irving Lodge on U. S. 101. CD 3/15.

▲ Barrett Constr. Co., 1800 Evans Ave., San Francisco, Calif., CA $1,775,000, jet aircraft hangar, at San Francisco International Airport, SAN FRANCISCO, CALIF. Transworld Airlines, Inc., 240 Stockton St., San Francisco, Calif. H. K. Ferguson Co., 102 Montgomery St., San Francisco, Calif., engr.

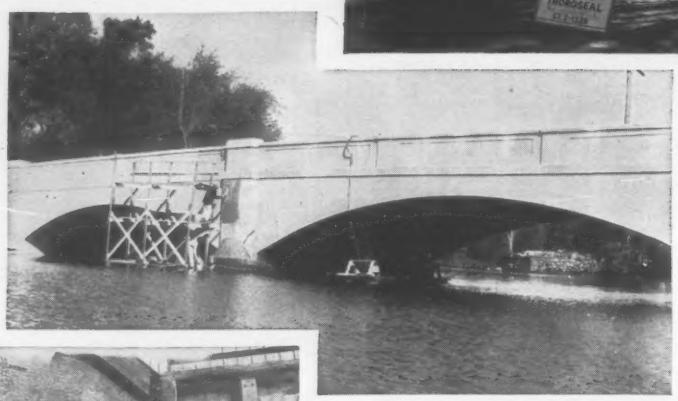
▲† Bureau Yards & Docks, c/o Res. Officer Charge of Constr., 333 Fell St., San Francisco, Calif., U.S.A., rejected bids Mar. 20, headquarters bldg., repair and maintenance hangar, roads and utilities, parking apron and taxiways at Naval Air Station, Agana Guam, officers mess and POL facilities at Anderson Air Force Base, Guam, NBy-3330, MARIANAS ISLANDS, GUAM, Est. $12,000,000. CD 2/4.

BUILDINGS—LB & CA

▲ Nelson Constr. Co., 3504 N. Monroe St., CA $1,871,446. general contract, Woodrow Wilson HIGH SCHOOL, in West End, TACOMA, WASH. School Bd. S 8 and Tacoma Sts., Tacoma, Wash. Bids Mar. 29. CD 4/2, under LB.

It's *New Again* with THORITE and THOROSEAL

Freeze-thaw cycle following water and moisture penetration, also swelling of reinforcing rods from moisture contact, cause masonry destruction.



BRIDGE OVER CONCORD RIVER
ROUTE 3, BELLERICA, MASS.

Workmen on scaffold patch spalled and cracked concrete with THORITE and seal surface with THOROSEAL.

Area at left chipped to sound masonry. It will then be patched with THORITE *Nonshrink, Nonslump 20-Minute Set Patching Mortar,* without necessity of costly forming, finished by application of Thoroseal.

Request Circular No. 16 and 20.

Write for our 16 page "How to Do It"

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNSYLVANIA • CENTERVILLE, INDIANA

▲ **Rothschild, Raffin & Wierick Constr. Co.,** 274 B nan St., San Francisco, Calif., LB $4,064,40 bidders) rein.-con. frame, structural steel Mills SCHOOL, MILLBRAE, CALIF. San Mateo Union School Dist., c/o Secy., San Mateo, Calif. John Reid & Partner, 1069 Market St., San Fran Calif., archts. Bids Apr. 9. CD 3/21.

▲ **Williams & Burrows,** 500 Harbor Blvd., Bev Calif., LB $1,973,770. ARTS BLDG., Santa Ba Campus, Goleta, SANTA BARBARA, CALIF. Univ of California, Santa Barbara College, Santa Bar Calif. CD 3/6.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREET AND ROADS
April 24, Ontario

BUILDINGS—LB & CA

▲ **Canadian Kellogg Co. Ltd.,** 33 Bloor St Toronto, Ont. CA Est. $10,000,000. REFIN 400-acre site adjacent to marketing depot, topping and vacuum facilities, catalytic cra catalytic reforming and alkylation units Port Mo near VANCOUVER, B. C. British American Oil Ltd., British American Oil Bldg. Toronto, CD 3/20/51.

▲ **Metropolitan Construction Ltd.,** 388 Donald Winnipeg, Man., CA Est. $7,000,000. supplying eration of 430 HOUSING UNITS to be leased Minister of National Defence for occupation by M bers of Canadian Forces, ST. JAMES, MAN. Ca Mortgage Housing Corp., 870 Portage Ave., Winn 10, Man. Bids Feb. 7, awarded Apr. 4. CD 12/1

▲ **Poole Constr. Co. Ltd.,** 10503 109 St., Edmo Alta. LB $5,415,350 (9 bidders) 2 HOSTELS SCHOOL at New Townsite, AKLAVIK, NORTHW TERRITORIES, Dpt. P. Wks., Hunter Bldg., Ott Ont. Bids Apr. 3. CD 3/27.

▲ **Rolmac Constr. Co. Ltd.,** 41 King William Hamilton, Ont., CA Est. about $2,000,000. HOUSES part of housing development at mining t ELLIOT LAKE, ONT. Rio Tinto Mining Co. Canada Ltd., 355 Bay St., Toronto, Ont. Awar Mar. 25, Grand total est. $5,000,000;
Brad Industries Ltd., 1390 Sherbrooke St. W., Mo real, Que., CA Est. about $1,500,000. 120 Ho (Elliot Lake, Ont.);
Barker Constr. Co., Ltd., c/o owner, CA Est. $1,500,000. 120 Houses (Elliot Lake, Ont.).

▲ **Doran Constr. Co. Ltd.,** 5 Concord St., Otta Ont. LB $4,864,897 Contract No. A; LB $5,024,9 Alt. Contract B, OFFICE, Elgin, Albert and Sla Sts., OTTAWA, ONT. Dpt. P. Wks., Hunter Bld Ottawa, Ont. Bids Mar. 20. CD 3/6.

▲ **Dickie Constr. Co. Ltd.,** 17 Yorkville Ave., Toron Ont., CA Est. $5,000,000. electric-resistance we steel pipe mfg. weld PIPE MILL, Crowland Tw WELLAND, ONT. Page-Hersey Tubes Ltd., 100 Chu St., Toronto, Ont. Awarded Mar. 29. CD 2/6/5 under Welland Tubes Ltd., as owner.

ALASKA

HEAVY CONSTRUCTION—LB & CA

▲† **Peter Kiewit Sons' Co.,** 1300 Aloha St., Seattl Wash., CA $11,842,238. Nike installations at Elei Air Force Base, Inv. 57-29, ALASKA U. S. En 4735 E. Marginal Way, Seattle 4, Wash. Bids M 20, awarded Apr. 5. CD 3/26, under LB.

▲† **Patti-McDonald Co.,** Anchorage, Alaska, and M **Contg. Co.,** Lloyd Bldg., Seattle 1, Wash., $9,495,744, est. $11,102,815. 1 battery cont bldg., 1 launcher control bldg., launching sect structures, etc. Site Bay, Site Summit and S Point Nike Sites, Inv. 57-30, Elmendorf Air Fo Base, ENG-57-30, ALASKA U. S. Eng., 4735 M ginal Way, Seattle 4, Wash. Bids Mar. 26, award Apr. 5. CD 3/29, under LB.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **International Contractors & Suppliers Associati** (composed of 33 companies, incl. Williams Bro Sudamerican Ltd., Natl. Bank of Tulsa Bldg., Tulsa Okla., USA, and International Standard Electric Co., combination of Citra (Schneider Enterprises), Franc Werkspoor, Netherlands, Ansaldo, Italy, Cockeril Ougree, Belgium, Costain-John Brown Ltd., England Sacem, Argentina) CA $268,000,000. pipe lines an facilities Camp Duran to San Lorenoz, ARGENTINA Yacimiantos Petroliferos Fiscales (Govt. Oil Agenc Buenos Aires, Argentina. Bids Mar. 29. CD 1/21

▲ **Constructora Lienca,** Villa Luisa, Avenida Casanova Bello Monte, Caracas, D. F., Venezuela. CA $2,132,238. airport at LaFria Airport in Tachia State LA FEI, VENEZUELA. Ministerio De Obras Publicas Direccion de Puertos y Aeropuertos, Centro Simon Bolivar, Torre Sur., Caracas, D. F. Venezuela. Bids Feb. 28, awarded Apr. 2. CD 3/28, under LB.

▲ **VENEZUELA**—Ministry of P. Wks., Caracas, D. F. Venezuela,
Martin Eng. Co., Maracaibo, Edo. Zulia, Venezuela, CA $12,000,000. 40 mi. highway between Bonono and Plazuela, Trujillo State.

(Proposal Advertisement see pp. 184 to 186)

Big trucks pay off on the big jobs!

Competitive operation on today's big yardage jobs calls for big dumpers that can keep tight schedules—especially when you're running a shovel that makes a 30-ton load in three or four passes. That's why so many operators are turning to Mack. For Mack gives them the toughest and most economical off-highway dumpers, as well as a large selection of competitively priced units to choose from—four basic units with a wide selection of engines, transmissions and converters . . . from four-wheelers with a 15-ton rated capacity to six-wheelers with a 34-ton rated capacity.

Here are some of the exclusive Mack features—wide selection of Mack or stock diesels ranging from 170 to 400 hp, each delivering maximum torque at low r.p.m. . . . superior Mack transmissions with two-speed compound or torque converter . . . planetary gear reduction in rear-axle wheel hubs for smooth power transfer without excessively large gears in the carriers . . . the exclusive Mack Balanced Bogie with Power Divider, the four-wheel, rear-axle drive that delivers maximum power to the wheels with traction . . . many models available from stock, the units you want with the engines and transmissions or converters you need supplied upon gratifyingly short notice.

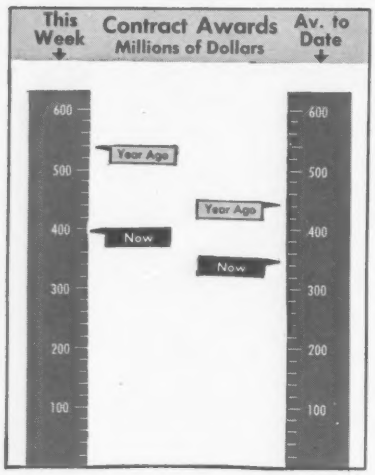
Why not investigate the large-capacity economy afforded by the complete line of Mack off-highway dumpers? Invite your Mack representative to give you full details and specifications. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

4868

MACK
first name for
TRUCKS

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 16 wks 1957	Chge %
		millions	
Federal	$26.4	$851.0	+51
State and Municipal	140.3	2,116.3	+13
Total Public	166.7	2,967.3	+22
Total Private	227.8	2,620.5	−44
U. S. Total	$394.5	$5,587.8	−21
By Type of Work			
Waterworks	$3.5	$99.6	+10
Sewerage	7.4	127.9	−36
Bridges	15.5	216.2	+25
Highways	51.3	885.7	+31
Earthwork, Waterways	8.0	339.5	+67
Buildings:			
Public, Excl. Housg.	47.3	658.1	+9
Public Housing	20.7	229.1	+117
Private Housing	67.1	896.8	−56
Commercial	40.2	522.4	−17
Industrial	109.3	1,020.6	−42
Unclassified	24.2	591.9	−5
U. S. Total	$394.5	$5,587.8	−21

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

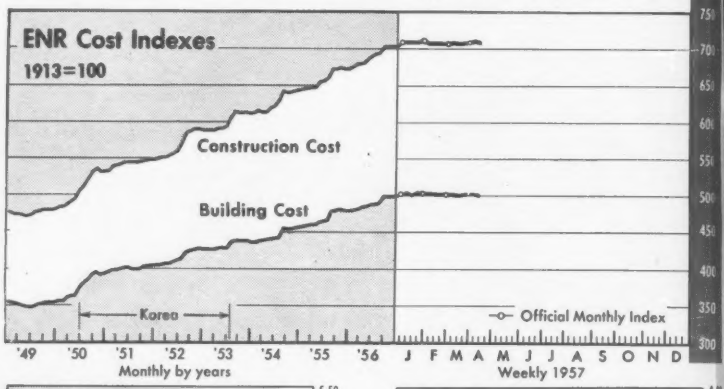
NEW CAPITAL FOR CONSTRUCTION

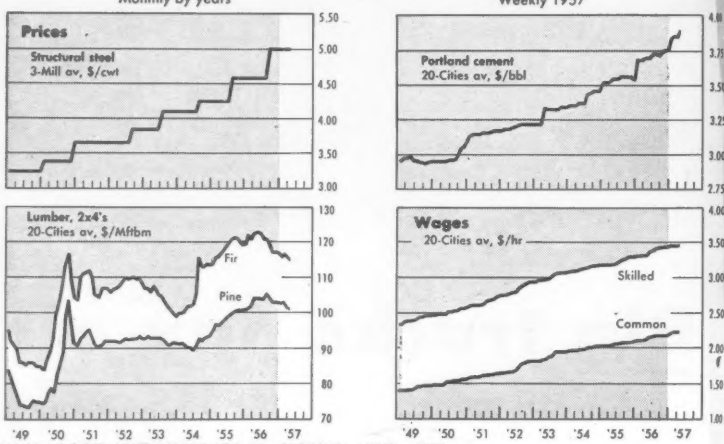
	Week of Apr. 11	Cum. 15 wks 1957	Chge '56-'57 %
	millions		
Corporate Securities	$116.5	$2,012.0	+126
State and Municipal:			
All Except Housing	82.7	1,610.5	+20
Housing	...	41.5	+104
Federal Loans	1.5	40.7	+19
Federal Aid	...	...	...
Total Nonfederal	$200.7	$3,704.7	+62
Federal Appropriations:			
In U. S.	...	...	−100
Outside U. S.	...	...	...
Total New Capital	$200.7	$3,704.7	+60

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	Week of Apr. 11 1957	% Change from Mar. 14 1957	% Change from Apr. 12 1956
Construction Cost	701.42	+0.2	+4.0
Building Cost	501.29	+0.1	+3.2

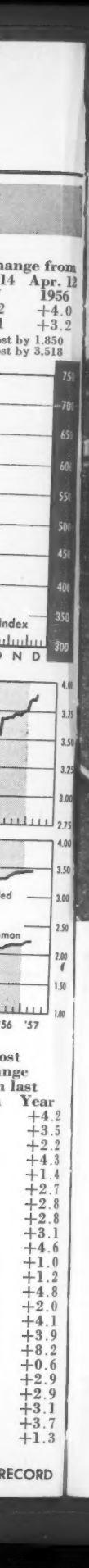
To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518





ENR COST INDEXES IN 22 CITIES, 1913=100

City	Construction Cost April 1957	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost April 1957	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	523	0	+4.2	442	0	+4.2
Baltimore	643	+0.2	+8.1	500	+0.2	+3.5
Birmingham	556	0	+1.3	457	0	+2.2
Boston	746	+0.3	+4.5	513	+1.2	+4.3
Chicago	789	0	+1.9	505	+0.2	+1.4
Cincinnati	711	0	+5.0	486	0	+2.7
Cleveland	822	+0.2	+3.7	511	+0.4	+2.8
Dallas	525	0	+2.7	439	0	+2.8
Denver	702	+0.7	+4.8	510	−2.5	+3.1
Detroit	809	0	+4.0	528	0	+4.6
Kansas City	714	−0.4	0	504	−0.6	+1.0
Los Angeles	731	0	+2.1	494	0	+1.2
Minneapolis	758	0	+5.1	527	0	+4.8
New Orleans	562	−0.2	+2.4	462	−0.2	+2.0
New York	853	+0.1	+4.2	579	+0.2	+4.1
Philadelphia	750	+0.1	+3.9	557	+0.2	+3.9
Pittsburgh	762	0	+10.8	541	0	+8.2
St. Louis	760	0	+0.1	529	0	+0.6
San Francisco	723	+0.4	+3.7	490	+0.4	+2.9
Seattle	749	+0.4	+4.2	456	+0.9	+2.9
U. S.—20 Cities' avg.	709	0	+3.8	501	0	+3.1
Montreal	580	+3.6	+5.1	445	+1.8	+3.7
Toronto	601	+0.8	+4.9	466	+0.9	+1.3



12 Ton Plymouth Locomotive operates 24 hours daily over 10 mile track system at this modern steel mill

PLYMOUTH lowers production costs by keeping steel in process on the move!

You get the reliability that returns greater profits when you put a Plymouth Locomotive to work—and the more continuous usage you give it, the more you benefit. There are many good reasons for that.

Plymouth Locomotives are built to handle big jobs with speed and efficiency around the clock—in all kinds of weather. Instant availability, low maintenance requirements, and faster switching, spotting and hauling performance reduces costs all around. Smooth starts and ease of control make Plymouth popular with the operators, reduce fatigue, and keep efficiency high.

We make both gasoline and Diesel Locomotives from 3 to 80 tons—either mechanical or Torqomotive (hydraulic torque-converter) drive—there's a Plymouth Locomotive that will fit your requirements perfectly.

"Saving time and money with our Torqomotive," says this user.

Within a few months after the Plymouth Diesel Torqomotive shown above was delivered, this Eastern steel manufacturer knew they had an outstanding locomotive. "Too early for actual cost figures," was the report, "but haulage by Plymouth is superior to previous methods. Our operator likes it better, too."

Send us a brief outline of your operation and we'll send you a recommendation promptly. Address: Plymouth Locomotive Works, The Fate-Root-Heath Company, Dept. A-22 Plymouth, Ohio.

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throughout the WORLD

ALSO BUILDERS OF
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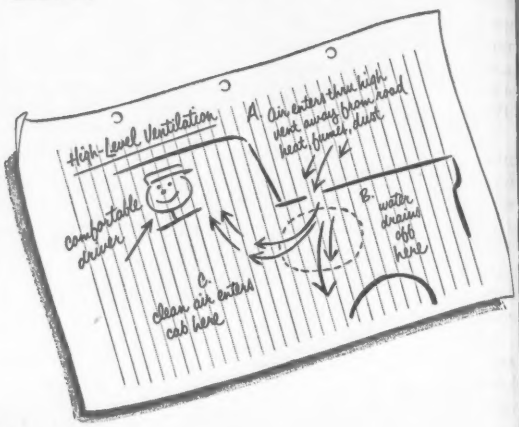
in a Chevy cab, even the air is better!


High-Level Ventilation
A. Air enters through high vent away from road heat, fumes, dust
comfortable driver
B. water drained off here
C. clean air enters cab here

...more evidence that Chevrolet Task·Force Trucks are engineered better and built better for bigger savings!

These cab features give you extra comfort and safety behind the wheel, extra savings on truck maintenance. And they're proof that the most modern trucks for your money are Chevrolets!

The drawing "doodled" above shows how Chevy's High-Level ventilation provides a *comfortable* interior . . . and the numbers in the big picture point out other advantages equally as good to have around you when you haul! They include:

1 *A roof that's specially built for safer, more comfortable hauling.* Sturdy all-steel construction adds to safety; roof's unique inner reinforcement insulates the overhead against heat.

2 *A gleaming, durable baked enamel outside finish.* Here's the reason your Chevy's exterior will resist wear better, look like new longer! This handsome finish is available in a wide variety of colors.

3 *A Nu-Flex seat that beats the bumps!* Deep-comfort coil springs, metered air shock damping and 3-way adjustment let you take it easy on tough jobs!

4 *A cab that's rustproofed to last!* Doors and similar surfaces are rustproofed on the inside as well as on the outside by immersion.

5 *Concealed Safety Steps for convenience.* Inside each cab door, they give you firmer footing, make entering or leaving the cab easier and safer.

6 *An undercoated floor, cowl side panels and fender flanges.* Virtually all exposed surfaces on the underside of the cab are protected by an anti-rust coating.

7 *A non-glare instrument panel to make driving safer!* The textured finish on upper portion of Chevy's instrument panel reduces blinding sun reflections, minimizes eyestrain.

8 *A reliable 2-speed electric windshield wiper* on each side.* Powered by electricity, their action remains *constant* under all conditions.

Such advantages as these (we've shown only a few) combine to make *everything* better in a 1957 Chevrolet truck! You'll see for yourself when you visit your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

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THE LONGER LOOK:
Canada Prepares for Phenomenal Growth

Canada will be a booming market for construction over the next 25 years as the Canadian economy goes through a period of phenomenal growth. The new facilities needed by a rising population and expanding industry are expected to boost the labor force employed in construction from 367,000 in 1955 to 625,000 in 1980.

This forecast comes from the recently published preliminary report of the Royal Commission on Canada's Economic Prospects, based on the estimates of several hundred of Canada's leading businessmen and economists. Specialized studies on construction and several other industrial sectors will be published separately.

Some idea of the growth Canada expects over the coming two-and-a-half decades can be grasped by a comparison with the growth of the U.S. economy over the years from 1930-1955. In those 25 years the gross national product in the U.S. increased 135%, as measured in constant 1955 prices. In the same terms, Canada expects its national product to shoot up 284% between 1955 and 1980.

Canada, of course, is starting off this quarter-century of growth from a small base of industry and population, compared with the U.S. Its population is only 16 million, or one-tenth of U.S. population. And its 1955 national product of $26.8 billion was only 7% as large as the GNP in the U.S.

But on a per capita basis, Canada is already close to U.S. standards. Her national product per person was $1,714 in 1955, compared with $2,344 per person in the U.S. And Canada stacks up well economically in comparison with other countries. It ranks third in the world in international trade, and it is the world's sixth largest manufacturing nation.

The Royal Commission will indicate in more detail just where construction will fit into Canada's growth prospects in its specialized reports. Here is a summary of what the commission has to say about the fast-growing industrial sectors that will provide the market for construction:

• **Mining**—Canada's key mining industries are in for a boom that will outrun even the threefold expansion of the economy as a whole.

As of 1955, Canada was producing well over 80% of the world's nickel and asbestos, 20% of the aluminum output, and over 10% of all copper, lead and zinc production. By 1980, Canada will be turning out about twice as much copper, four times as much iron and five times as much aluminum.

• **Energy Resources**—Canada now has one of the highest per capita energy consumption rates in the world.

By 1980 it is estimated that 10 times as much oil will be produced and 15 times as much natural gas. Investment in the oil and gas industry might run close to $25 billion over the 25 years 1955-1980.

Hydro-electric installations, including transmission and distribution facilities, may require investment of $15 to $20 billion in the 25 years. This would make the value of hydro-electric power output in 1980 four or five times as great as in 1955.

• **Manufacturing**—Canada will place emphasis in manufacturing of finished goods on getting a larger share of its own domestic market.

It expects total manufacturing employment to rise by about 75% in the 25 years.

To accomplish this, Canada will need heavy investment in plant and equipment to raise productivity, now running 35-40% below average productivity in U.S. manufacturing industries.

• **Other Industries**—Increasing numbers of Canadians will be employed in government, transportation, communications, trade, finance and other services.

By 1980, these "service" industries will account for 55% of the employed labor force. With this increase will come rising expenditures for commercial buildings, highways and communication facilities.

Agriculture will become relatively much less important. In 1946 one-fourth of all employed Canadians were on farms; by 1955 the proportion dropped to 15%; and by 1980 it will be only 7%.

• **Foreign Capital.** A key problem in Canada's economic development is its heavy reliance on foreign capital.

By the end of 1955, long-term foreign capital in Canada amounted to $13.5 billion. And foreign investment has been providing a rising share of net capital formation.

Foreign investment in Canada financed only 13% of net capital formation in the years 1950-1954. But the proportion rose to 25% in 1955, and estimates for 1956 put the figure even higher. The heavy flow of capital into Canada, indeed, has been responsible for the rise in the value of the Canadian dollar—from about 91.5¢ in terms of the U. S. dollar in 1950 to almost $1.05 now.

The worry of Canadians over the influx of foreign capital—primarily from the U. S.—stems from two features of this investment.

• It is becoming concentrated in key sectors of the economy, especially in manufacturing and development of resources. As early as 1953 over half the capital employed in the petroleum, mining, chemical and electrical apparatus industries was American.

• U. S. investment in Canada has tended to be more or less permanent equity ownership of Canadian industry.

Canadians hope to find ways of increasing the stake of their own countrymen in Canadian development. But it must do this in a way that will not discourage foreign investment. For, without the spur of foreign investment, Canada cannot expect to fulfill the ambitious growth charted by its Royal Commission.

$70 Million Bond Issue Will Complete Expressway

The Jacksonville, Fla., Expressway Authority has sold $70 million in revenue certificates to finance completion of its expressway system.

The bonds were sold to a syndicate headed by Smith, Barney & Co., New York, and Pierce, Carrison & Wulbern, Jacksonville, at a net interest cost of 4.3216%, but with a liberal call feature that will permit refinancing should bond conditions improve.

About $25 million of the proceeds from the issue will be held in trust to pay off the balance of the original $28 million issue sold in 1950. The balance of the bond proceeds will be used for right-of-way and for construction.

(*B&F continued on page 172*)

Prices Move Up

Wage, lumber increases push costs upwards

Lumber price increases in Boston, Chicago and Cincinnati plus wage increases for common laborers in Kansas City combined last week to put the ENGINEERING NEWS-RECORD 20 Cities Construction Cost Index up 2 points, to a record 711, based on 1913=110.

This was the most significant movement in the index since the wave of cement price increases at the start of 1957.

The increases ended the marked stability of the index during the past 12 weeks. The index is now 1 point above the previous high of 710 reached in February.

The ENGINEERING NEWS-RECORD Building Cost Index for 20 cities also moved up last week to 502 (1913 = 100). However, this index is 1 point below the record 503 recorded in January.

Compared to a year ago, the Construction Cost Index is up 4%, while the Building Cost Index is up 3.2%.

Since the end of 1956 the ENR Construction Cost Index has risen by 5 points (0.7%) as against a 10 point rise during the corresponding 14 weeks of 1956. The ENR Building Cost Index has increased by only 2 points (0.3%) this year as against a 7 point increase a year ago.

Last week brought further evidence of firming prices for Douglas fir lumber. Prices advanced $1 to $2 per Mftbm in three cities, making a total of six cities where prices are higher than they were a month ago.

But some soft spots in the fir demand picture still remain. Minneapolis reported a drop, San Francisco lost half of a recent price increase, and fir prices also have declined in recent weeks in Denver, Kansas City, and New Orleans.

Housing Falters

March starts are lowest for that month since '49

The government last week added another verse to a long, mournful ballad —the housing downturn continued in March.

Housing starts last month were the lowest for any March since 1949, according to the Bureau of Labor Statistics.

March housing starts totaled 83,000 units, up seasonally over February, but 16% under March 1956. The March starts were at an adjusted annual rate of only 880,000, which was also the lowest since 1949.

Last month's starts included 75,500 privately financed units and 7,500 publicly financed units, the latter all built under the government's Capehart military housing program.

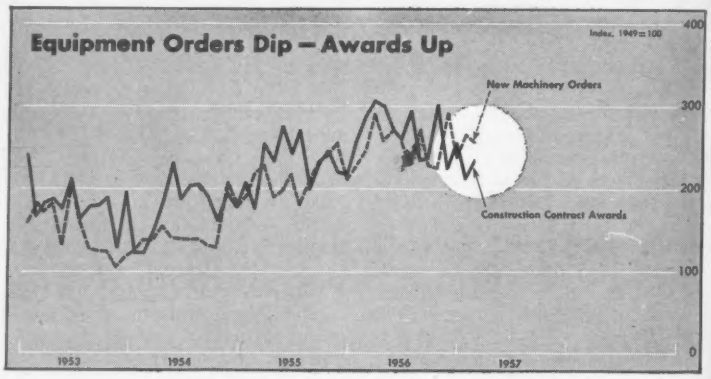
The government's figures showing the trend of housing starts in the first quarter indicated that the situation is getting worse, not better. According to BLS figures, January starts were at a seasonally adjusted annual rate of 1,010,000 units; February's indicated annual rate was 910,000—and March was only 880,000.

First quarter housing starts totaled 213,000, lowest since 1949.

The Bureau of Labor Statistics also reported its final figures for 1956. The figures showed a drop of 16% from 1955. The 1956 total of 1,118,100 units started compared with a record 1,329,000 starts in 1955.

"Sharpest cutbacks in homebuilding in 1956 were in the metropolitan areas, where housing starts were down 20% compared with only 4% in the nonmetropolitan areas. Regionally, the 1955-56 decline in nonfarm housing starts ranged from 14% in the South to 19% in the West."

The government's report on March housing starts brought a blast from the National Association of Home Builders which urged Congress and the Administration to "stop gambling with the welfare of the American people."



Construction Machines Moving To Jobs at Near Record Rate

Construction contractors are ordering new machines at the second highest rate for January and February.

For the first two months there is a 12% increase over 1956 in new orders received by manufacturers of construction and mining machinery according to the McGraw-Hill Department of Economics Orders Index.

Although the rate of new orders tapered off a bit in February (see chart) the index value of 258 (based on 1948 = 100) was the second highest on record for the month. Only February 1952's value of 300 was higher.

The gain so far over 1956 is running close to the 15% increase forecast by manufacturers for the first quarter of 1957.

But there is some question whether future orders will come as close to the 26% rise for the whole year forecast by the industry. That's because private building construction contracts have been moving downward sharply since hitting their peak early last year. This is a situation similar to the 1953 and early 1954 period.

While there is good reason to expect an upturn in private contracts soon, the current slump may temporarily hinder new equipment sales and prevent them from hitting the 1957 target.

However, heavy construction contracts for other types of work namely highways, bridges, dams, waterworks and public schools are booming at an unprecedented rate. This is making up for part of the loss of new private business and should keep contractors ordering new machines at a high rate during the rest of 1957.

(*B&F continued on page 174*)

WHYTE STRAND

wire ropes are made to meet the needs of today's high output machines. There is a WHYTE STRAND wire rope in the correct size and construction for each use on all your machines. These Macwhyte ropes are PREformed for maximum flexibility, internally lubricated for super service, and stocked for immediate delivery.

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Public Housing

Court upholds power of Columbus agency

An Ohio public housing authority has won a test case on its power of eminent domain clearing the way for an early start on a $6 million project.

The Columbus Metropolitan Housing Authority received funds to proceed with a 524 unit project in the Bonham-St. Clair area of the city.

Franklin County Common Pleas Judge Robert Leach dismissed the request of two residents in the area for an injunction preventing acquisition of land by the housing authority.

The two property owners sought the injunction on the ground that there are 119 safe, sanitary and adequate residents already in the area and that 400 people would be made homeless by construction of the public housing project.

The suit was considered a test case since the housing authority already has condemnation proceedings pending against other properties in the vicinity.

Jury hearings on compensation and damages for properties in the area are scheduled in County Common Pleas Court in the near future.

In ruling against an injunction, Judge Leach said a few above-standard properties cannot be permitted to stand in the way of the entire project.

"It is fundamental," Judge Leach ruled, "that the necessity for and the extent of the property taken by eminent domain are questions for administration and in the absence of abuse of discretion, will not be disturbed by the court."

Construction Markets

Houston: An On-the-Spot Report

Construction in the metropolitan Houston, Tex. area, which zoomed over the $350 million mark last year, seems likely to reach the same point in 1957.

Industrial expansion, spurred by a $118 million program by Armco Steel Corp. at its Sheffield plant, is the most noteworthy element in the Houston construction picture at the present time.

A majority of these expansion projects are keyed to both present and future growth of the Houston area. Houston also has profited from the Gulf Coast's booming chemical and oil refinery business.

The construction outlook also is brightened by ambitious spending programs started by the Houston Public Works Department, the Houston Independent School District, and the Texas Highway Department, which will spend $20 million in the Houston area.

The only drag on the construction market is housing. Houston builders even see signs of life in this area with conventional homebuilding sparking a slight move upward. Homebuilding is down between 10% and 15% from last year.

Plans for the Houston Parade of Homes, which is held in May, give a good idea of the trend. In the past, emphasis has been placed on low-price GI and FHA homes. This year, the show will include 25 homes. All will be in the $25,000 and up price class and all will be conventionally financed.

GI homebuilding is reported to be off as much as 75% to 80%. FHA housing is down as much as 50%, but is expected to show some improvement in the next few months. However, bankers say that home sales are picking up. By summer, unsold houses will be at a premium if the present rate of building continues.

Growing with the city is Houston Lighting & Power Co. which will spend an estimated $69.1 million this year for expansion. Southwestern Bell Telephone Co. plans a $25 million expansion program in the works.

Commercial and industrial development has been rolling along in high gear, but recently fewer starts and inquiries have been noted. Builders now say competition is markedly keener.

Among new projects are a $10 million, 27 story office building and a connecting $5 million hotel-motel. A $6 million 22 story office building is planned near the center of the downtown area.

Projects outside the metropolitan area but in the Houston Gulf Coast area, include a new $27 million catalytic cracking unit for Humble Oil & Refining Co. at the Baytown refinery; a $30 million styrene plant planned at Orange by Firestone Tire & Rubber Co.; a $45 million plant under construction by Aluminum Co. of America at Point Comfort; a $45 million expansion program by Dow Chemical Co. at Freeport and a $12 million ethylene plant at Sweeny being built by Phillips Chemical Co.

The Houston Public Works Department spent $21 million in 1956 and has $19.3 million worth of work coming up this year. The city plans to spend $8.5 million on storm and sanitary sewers, $2.8 million on paving and surfacing, $2 million on street right-of-way acquisition, $1 million for bridges, $1 million for airport improvements and $1 million for park improvements. At least half of the contracts are expected to be let in the first half of 1957.

Houston doubled its area last year by annexation. But litigation is in the courts and the city work program does not include any of the new area.

Right-of-way problems reportedly have slowed the Texas Highway Department in Harris County, but the department's program includes $20 million of construction work plus about $5 million for right-of-way acquisition.

Major state highway work involves grade separations for U. S. 75 to bring it up to interstate highway standards. Construction also includes interchanges and work on freeways.

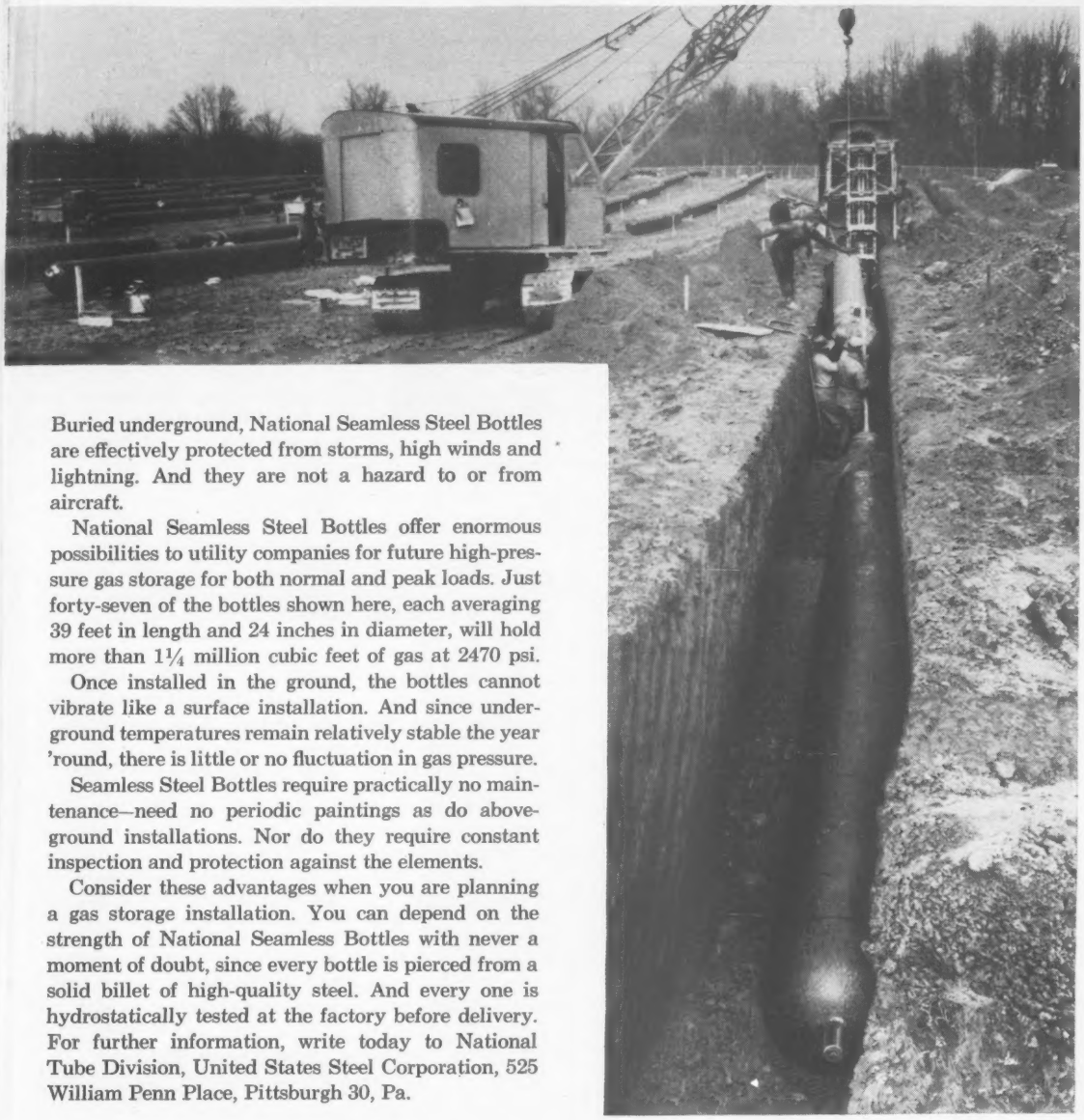
Another ambitious construction program is that of the Houston Independent School District. Spurred by a growing enrollment, the district plans to let $15 million in contracts this year, with most of the work slated for award in the next few months. The $15 million is half of a $30 million bond program voted last year.

Another aspect of the Houston construction market is port improvement. Houston voters approved a $7 million port improvement program in January. Money will go for new docks, transit sheds and rail and road facilities.

Houston's construction market although undergoing some changes, is likely to be strong and healthy through 1957, at least matching the 1956 construction volume.

Safe and sound—*underground!*

NATIONAL SEAMLESS STEEL BOTTLES



Buried underground, National Seamless Steel Bottles are effectively protected from storms, high winds and lightning. And they are not a hazard to or from aircraft.

National Seamless Steel Bottles offer enormous possibilities to utility companies for future high-pressure gas storage for both normal and peak loads. Just forty-seven of the bottles shown here, each averaging 39 feet in length and 24 inches in diameter, will hold more than 1¼ million cubic feet of gas at 2470 psi.

Once installed in the ground, the bottles cannot vibrate like a surface installation. And since underground temperatures remain relatively stable the year 'round, there is little or no fluctuation in gas pressure.

Seamless Steel Bottles require practically no maintenance—need no periodic paintings as do above-ground installations. Nor do they require constant inspection and protection against the elements.

Consider these advantages when you are planning a gas storage installation. You can depend on the strength of National Seamless Bottles with never a moment of doubt, since every bottle is pierced from a solid billet of high-quality steel. And every one is hydrostatically tested at the factory before delivery. For further information, write today to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

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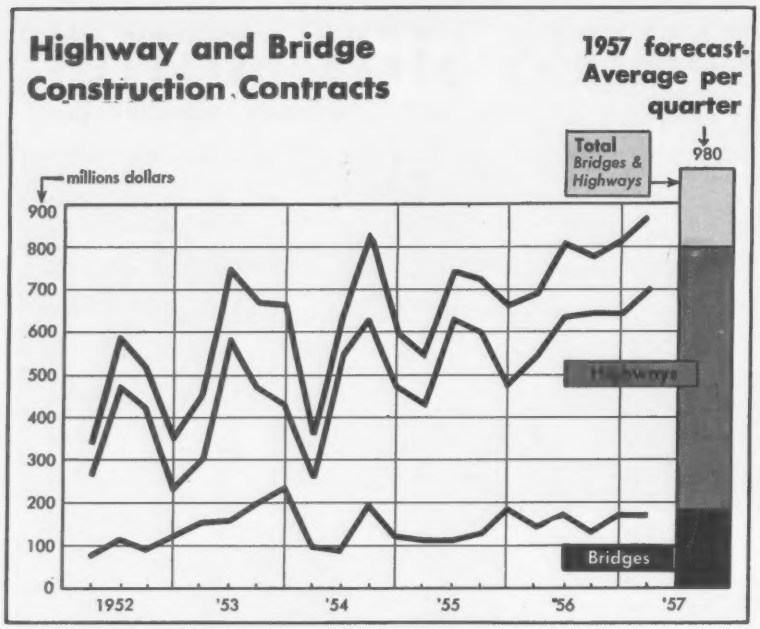
UNITED STATES STEEL



Highway Contracts Booming

Highway and bridge construction contracts are running 26% above last year.

Total awards, as reported by ENGINEERING NEWS-RECORD and CONSTRUCTION DAILY, added up to a record $1.03 billion during the first 15 weeks of this year.

Of the total, highway contracts accounted for $834 million, up 28%, while bridge awards reached the $201 million mark, up 19% over the year ago figures.

The dynamo that has driven highway and bridge awards to new records is the interstate highway program. All of the rise in state highway department contracts this year is due to the interstate program, according to figures just released by the Bureau of Public Roads covering the first two months of the year. (ENR and CD do not classify highway or bridge contracts by interstate or by the governmental unit awarding the contracts. As a result, ENR-CD figures include county, town, municipal and federal projects.)

• Interstate volume triples—The Bureau of Public Roads reported that during January and February, state highway departments awarded $153.3 million in contracts for the interstate system, nearly three times the volume of awards on interstate highways in the comparable 1956 period.

The interstate work represented 33% of the total highway and bridge contracts let by state highway departments and tollroads during the first two months.

State awards for other types of roads fell sharply in comparison with last year. Such awards trailed the 1956 period by 21% indicating that the states are concentrating on the interstate net where the federal government pays 90% of the cost and the states only 10%.

Contracts for the primary, secondary and urban highway projects lagged 9.7% behind 1956, totaling $187 million for the first two months.

The decrease was largely attributable to the decline in tollroad awards. The $73 million total for January and February for the states' free highways was only 3.6% below the year ago pace. But, tollroad and toll bridge contracts in this two month period plummeted 58% below the year ago total. Only $44.7 million in contracts for toll facilities were awarded in the first two months of 1957.

• New York leads on interstate—New York is setting the fastest pace in contracts awarded for the interstate system, accounting for nearly 21% of the total. The Empire State awarded $90.2 million in contracts during the first eight months of the program, from July 1956 through February 1957.

By the end of February, 43 states had awarded at least one contract for their share of the interstate, since the beginning of the new expanded program. These 43 states let contracts for 310 projects, with a total contract value of $441.5 million.

Ten states accounted for 76% of the total contract cost. These were: New York, $90.2 million; Ohio, $51.2 million; Texas, $42.8 million; California, $38.8 million; Pennsylvania, $30.1 million; Missouri, $21.3 million; Maryland, $18.4 million; Illinois, $15 million; New Mexico, $14.6 million; and Michigan, $13.7 million.

Texas led in the number of projects awarded with 43, followed by Illinois with 29 and Michigan, 25.

Five states—Delaware, Kentucky, Nebraska, Vermont and West Virginia—reported no interstate highway awards in the first eight months of the program.

• Midwest is top region—The Midwest has taken a big lead in the first quarter of this year in total highway and bridge awards, posting a figure of $242 million of which $59 million was for bridge contracts. This was 28% of the total of $871 million reported for the nation. This region's share of the total market in 1957 is well above its 18% share of the interstate awards reported by BPR.

Highway contracts for the Midwest during the first quarter were more than double the year ago rate. And, total bridge and highway contracts are three-and-one-half times greater than last year.

An even bigger percentage gain in highway awards in the first quarter came in the Middle Atlantic States, which racked up a total of $158 million, up 144% over last year. Bridge contracts totaled $32 million in the first quarter, up 39% over a year ago.

Big increases in highway awards also were reported in the first quarter for the Far West, up 58% to $81 million, and the South, up 27% to $100 million. But bridge contracts declined from 10% to 15% in these two regions.

The West of the Mississippi region, which includes Texas and 12 other states between the Mississippi and the Rockies, shows a modest 3% rise in first quarter highway awards to $141 million. But, awards for bridges climbed 44% above last year, totaling $36 million.

The only region that has failed to increase highway awards this year is New England, which is 72% under the first quarter of 1956, principally because the year ago figure included a large volume of awards for the Connecticut Expressway.

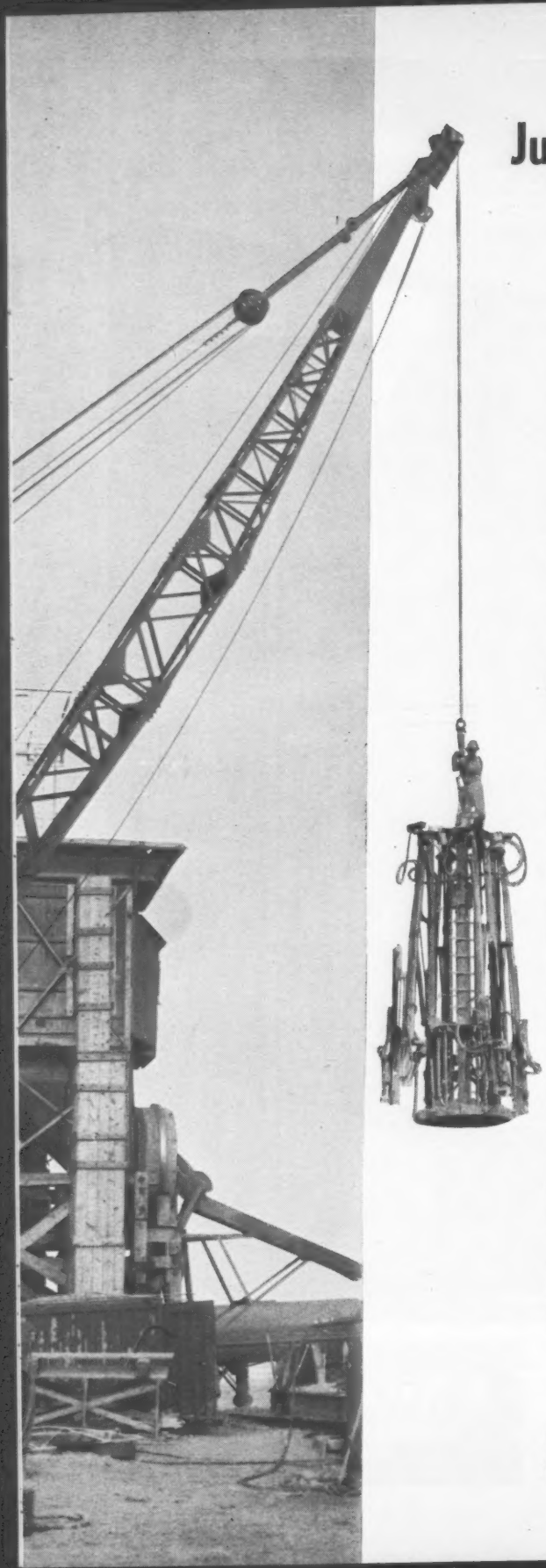
MONOTUBE
PILE DATA
TYPE PILE—YN
UNSUPPORTED LENGTH—10 feet
BUTT DIAMETER—16 inches
GAUGE—#7
DESIGN LOAD—50 tons
OWNER: Commonwealth of Massachusetts
ENGINEERS: Bridge Dept., Mass. Dept. of Public Works
GENERAL CONTRACTOR: Campanella & Cardi Construction Co., Hillsgrove, R. I.
PILE DRIVING CONTRACTOR: C. L. Guild Construction Co., Inc., East Providence, R. I.

STRENGTH *plus* VERSATILITY with Monotube piles . . . a perfect combination for this bridge on the Mid-Cape Highway, Dennis, Mass. *Acting as columns*, as well as foundations, Monotube steel piles provide necessary strength, eliminate column form-work and add to architectural beauty.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL

Monotube Foundation Piles



Jumbo Sinks 18 Foot Diameter Shaft 10 Feet per Day!

Le Roi multiple drill rig speeds Wyoming mine project

"Only this Le Roi jumbo rig could make this kind of progress." That's the opinion of experienced mining engineers at the site of a new mine shaft near Green River, Wyoming.

Their job was to drive an 18 foot diameter ventilating shaft 1600 feet straight down through hard Wyoming rock. They did it in record time with a Le Roi Shaft Jumbo.

Le Roi's Shaft Jumbo is a self-leveling multiple drill rig. It has four extendible arms, each mounting a heavy sinker drill on an independently controlled 2-to-1 air-feed shell. Each arm is mechanically positioned by air motors.

On the Wyoming job, each round in the hard formations required 65 holes drilled to an average depth of 12 feet. The drilling pattern included a row of holes spotted around the perimeter, with successive inner circles offset for maximum shattering and fragmentation.

Each complete drilling sequence was finished by the Jumbo in an average of 3 hours. By using the feed shells, instead of hand-held jackhammers, steel changing was eliminated. On a 65-hole round, 12 feet deep, time saved was considerable . . . and multiplied by the shaft depth, amounted to real money!

In addition, drilling was much more accurate using the positive feed, air-motor positioned drills. This meant more accurate patterns. Worker efficiency increased, too. Easily controlled feeding eliminated the big source of worker fatigue.

The Le Roi Shaft Jumbo can drill shafts from a minimum diameter of 11′-9″ up to a maximum diameter of 28′-0″, and shafts have been sunk with the Jumbo to a depth of 3,000 feet. Normally equipped with 4 drills, the Jumbo can be furnished with 2 or 6, if desired. It is also available with dust collectors. For complete information, contact your local Le Roi distributor, or write us direct.

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Cleveland air tools, Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

A New Role for the Labor Board

Federal Court of Appeals rules that the NLRB must determine jurisdictional disputes on their merits

A radical departure from the present procedure for settling jurisdictional disputes in the construction industry is called for by the U. S. Court of Appeals for the Third Circuit.

The court has ruled that the National Labor Relations Board is obliged by law, when called upon, to decide jurisdictional disputes on their merits. The case involved the long-standing jurisdictional dispute between riggers and pipefitters in Philadelphia over the right to move and set up equipment used by pipefitters.

If the Court of Appeals is upheld by the U. S. Supreme Court, the National Joint Board for the Settlement of Jurisdictional Disputes in the Construction Industry will no longer enjoy its exclusive jurisdiction or be the final authority on work assignments. Unions, such as the lathers, that have questioned the propriety of some Joint Board decisions will stand a chance of getting those decisions reviewed on their merits by the NLRB.

The Joint Board was established by labor and management under a voluntary agreement that provides no outside review of Joint Board decisions and that contains no machinery for enforcing those decisions. This circumstance—coupled with a consistent refusal by the NLRB to resolve disputes in the industry or to enforce Joint Board decisions—has enabled unions to ignore with impunity Joint Board decisions not to their liking. Net result, despite the praise often accorded by the Joint Board, has been an industry failure to end jurisdictional disputes.

• **Philadelphia case**—Out of the Philadelphia case between riggers and pipefitters now has come a legal analysis that may end this muddle—a muddle that the court suggests was created by the industry and the NLRB rather than by Congress.

The dispute originally reached the NLRB on an unfair labor practice charge filed by Local 161 of the riggers union (affiliated with the International Association of Bridge, Structural and Ornamental Iron Workers) against Locals 420 and 428 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry.

Gist of the charge was that the pipefitters had engaged in a jurisdictional strike to compel assignment of the disputed work to them—a form of action outlawed by the Taft-Hartley Act except where the work assignment violates an NLRB certification.

Without deciding which union should do the disputed work, the board merely ruled that the pipefitters could not lawfully engage in a strike to achieve their objective, and ultimately ordered the pipefitters to refrain from striking. The Court of Appeals was asked to enforce the order. It refused to do so, ruling that the board could not issue such an order without first deciding the basic dispute on its merits.

• **Present approach**—The Philadelphia situation is not unique. In handling construction industry jurisdictional disputes in the past, the NLRB has established the precedent of giving the Joint Board exclusive jurisdiction over deciding to which union any disputed work properly belongs.

If contractors and unions involved in a dispute are under the Joint Board procedure, the NLRB will decline to hear the dispute. That is the precedent set in the now-famous Lee case in which the lathers sought to upset a Joint Board acoustical ceiling decision in favor of the carpenters.

If one of the parties to a dispute, however, is not under the Joint Board procedure, the NLRB will hear the dispute. But even in this situation, it has consistently declined to make a work-assignment decision. Instead, it decides that the union coercion is or is not unlawful and leaves the fundamental dispute still unsettled.

• **The law**—But the Court of Appeals now says that this is not what the law intends.

The Taft-Hartley provisions are relatively simple. Coercive action to influence work assignments is an unfair labor practice. The NLRB is empowered to prevent such practices. When a charge is filed, the board can issue a complaint, hold a hearing and issue a cease and desist order.

If the unfair labor practice charge relates to work assignments, the board is "directed to hear and determine the dispute" under Section 10(k), with a cease and desist order following that determination, if necessary. Only exception is that a Section 10 (k) hearing need not be held if the disputing parties agree to a method of voluntary settlement—in which case the NLRB is authorized to dismiss the charge provided "voluntary adjustment" is reached.

According to the Court of Appeals, this scheme is designed to achieve "the actual settlement" of disputes and makes an NLRB "ruling on the merits" of the basic dispute "obligatory". Without such a ruling, the court says, the board has no authority to issue a cease and desist order, which is simply a method of enforcing its decision on the merits. And, the court notes, there is nothing in the legislative history of the law to indicate that Congress intended otherwise. The complications that may result, said the court, provide "no escape from what to us seems a necessary construction of Section 10(k)."

The court does not discuss the Section 10 (k) exception under which the NLRB has given the Joint Board exclusive jurisdiction. But the language of the court indicates that the exception does not relieve the NLRB of its obligation to pass on the merits of a jurisdictional dispute even if the Joint Board has determined the dispute before the unfair labor practice charge is filed. For the court says the Section 10 (k) provision "is inflexible" and leaves the NLRB "no room" to decide "whether it should or should not make a determination of the underlying jurisdictional dispute". Coupled with this is the law's two-fold declaration that (1) the board's power to prevent an unfair labor practice "shall not be affected by any other means of adjustment", and (2) dismissal of charges rests on a "voluntary adjustment" rather than on the existence of machinery for adjustment, which the Lee case indicated was enough to cut the NLRB out. This leaves little room for the Section 10 (k) exception to relieve the NLRB of its obligation to decide disputes on their merits even where the Joint Board has entered the picture, because no "settlement" could have been achieved if the facts still warrant the issuance of an unfair labor practice complaint.

In the light of the court's decision, the NLRB rather than the Joint Board thus appears to be the final arbiter of jurisdictional disputes, and it looks as if any union can force the NLRB to assume that role by merely engaging in a jurisdictional strike either before or after the Joint Board has acted.

(*Labor continued on page 180*)

Long-Term Gains in the Making

New wage pacts show fringe benefit improvements, longer terms and hourly gains of 10 to 16 cents

In many instances, wage settlements with the building trades are adding another 15 cents or more an hour to construction labor costs. Wage boosts in one year contracts are running from 9 to 23 cents an hour, and package increases in two year contracts are hitting as high as 40 cents. Interest in longer-than-one-year contracts and in improved fringe benefits continues, deferred increases in one year contracts are showing up, and strike pressure continues to be spotty. The picture in southern Canada—both east and west—is substantially the same.

Here is a roundup of recent developments:

• **California** – Associated General Constructors' Northern and Central California Chapters have been asked by union laborers for a 40 cent hourly wage boost, plus job reclassifications and $5 a day subsistence pay. Present long-term pact, affecting 30,000 workers, was reopened for wage talks. Negotiations are in process with the 42 county carpenters, cement masons, teamsters and operating engineers.

• **Colorado**—While 200 plumbers and pipefitters at the Colorado Springs Air Force Academy project were striking for pay equal to that of Denver plumbers, 1,200 plumbers and pipefitters in Denver agreed to a one year contract granting an 18 cent wage boost retroactive to April 1 and another 5 cent increase Oct. 1, when the scale will be $3.35. Travel pay is granted for travel beyond 15 miles.

• **Connecticut**—A two day, state-wide strike of sheetmetal workers (Local 40) ended in a one year contract boosting the hourly wage 15 cents the first six months and 8 cents the last six months. New scale became $3.30 April 3. Old fringe benefits—9 cents for welfare, 7 cents for pensions, and two paid holidays—are continued.

In New Canaan, the carpenters (Local 409) settled with the Building Trades Employers Association for a 9 cent increase under a one year contract —they had struck 10 days for a two year contract with boosts of 9 and 15 cents. Existing fringe benefits are carried over.

• **Delaware**—Allied Construction Industries of Delaware and the laborers union (Locals 199 and 847) have signed the state's first five year contract in the construction industry. Effective May 1, New Castle skilled and common labor will get a 10 cent increase (raising the scale to $2.05) with another 10 cents next year. Kent and Sussex County laborers will receive a 10 cent increase May 1 with 15 cents more next year.

• **Illinois**—Construction in Springfield was slowed down on April 1, when 650 members of the laborers union struck to enforce demands for a 25 cent hourly wage boost, one coffee break, travel pay on jobs outside the city limits and a clause requiring an employer to see the union steward before firing an employee. Pre-strike scale for common laborers was $2.25.

• **Michigan** – Detroit sheetmetal workers (Local 281) obtained a 29 cent wage boost in a two year contract with the Air Conditioning Institute. First installment of 19 cents is effective May 1, with another 10 cents May 1958. In addition to old fringe benefits—10 cents health and welfare, 16 cents vacation, and 2% pensions—workers will be paid 3 cents an hour for a joint industry promotion fund. Still in negotiation are contracts for boilermakers, bricklayers, electricians, laborers, engineers, painters and plumbers.

• **New York**—Settlements have been reached with eight of the building trades in Syracuse by the Building Trades Employers Association on the basis of one year contracts granting seven trades a 15 cent boost and one trade a 20 cent increase. Five trades also will receive an extra 2½% increase in lieu of travel pay. New scales range from $2.45 for laborers to $3.60 for bricklayers.

• **Oklahoma** – Associated Plumbing and Heating Contractors of Northeast Oklahoma have agreed to a 26 month contract giving plumbers and pipefitters a 40 cent wage increase—25 cents now and 15 cents in May 1958—resulting in a present scale of $3.45.

• **Canada**—A three year contract between the Lincoln and Welland Labor Bureau and locals in the plumbers union standardizes wage rates for the trade in Niagara Falls, Welland and St. Catherines. Hourly wages in the area will rise 35 to 55 cents during the contract term. Uniformity is achieved through initial increases of 10, 15 and 30 cents, with uniform increases of 15 and 10 cents to follow the second and third years. New area-wide scale is $2.40.

In Montreal, plumbers and pipefitters (Local 144) settled, after a strike and lockout, for a two year contract with the 470-member Montreal section of The Corporation of Plumbing and Heating Contractors of the Provine of Quebec. A 10 cent increase, effective April 1, puts the journeymen scale at $2.22; a 5 cent boost will follow next year. Vacation pay was upped from 2 to 4%. The strike, aimed at a Foundation Co. of Canada, Ltd. project at Ville d'Anjou in an effort to force contractors to negotiate individually, ended in an association-wide lockout by the employers.

In British Columbia, more than 120 lower mainland firms have agreed to give union painters (Local 136) a 41 cent wage increase in a two year contract—15 cents as of April 1, 10 cents Sept. 1 and 15 cents next April—making the current scale $2.35. New and higher differentials are provided for spray and roller painting and for dangerous work, travel pay is improved, and two rest periods a day are granted.

Carpenters in the area have turned down a two year offer of 32 cents an hour, plus 7 cents health and welfare.

• **Comparison**—In contrast to these recent developments, the Bureau of National Affairs reports that first-quarter 1957 construction industry settlements granted immediate hourly wage boosts that "clustered between 10 and 16 cents, with the average (mean) at 14.6 cents;" deferred wage increases under three year contracts averaged 12.8 and 10.5 cents an hour, in that order.

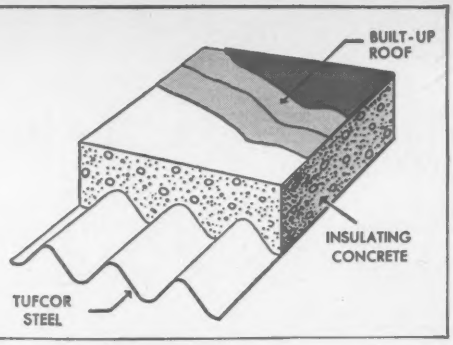
The BNA analysis, based on 67 settlements reported in its "Construction Labor Report," notes that over half the new contracts run for more than a year and that "more and higher fringe payments appear to be the rule." Fringe contributions in all the contracts, it says, averaged out at 13.8 cents an hour. Types included are health and welfare, pensions, vacation, apprentice funds, holiday pay and publicity funds—with relative popularity following in that order.

UAW Intensifies Its Bid for Engineers

A new bid for professional and technical members was made by the United Automobile Workers, AFL-CIO, last week, when the union approved a new program that would cater to the particular needs of non-production workers.

The action taken at the union's Sixteenth Constitutional Convention held in Atlantic City, N. J., came at a time when Engineers and Scientists of

TUFCOR® offers permanent firesafe roof construction at low cost

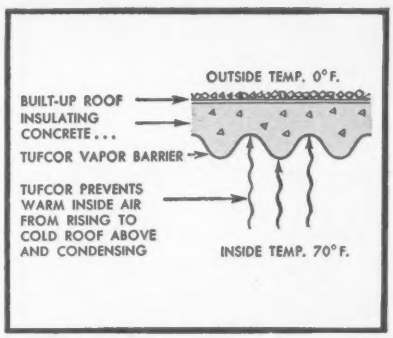


EASY TO PLACE. Galvanized corrugated Tufcor sheets arrive at the job site conveniently bundled and pre-cut to fit structural framing. No measuring or cutting is required. Three men can easily place and weld 5000 to 7500 sq. ft. of Tufcor in a single day. Low dead load of the finished Tufcor roof system (4 to 6 psf less than most types of roof construction) offers pronounced savings in the structural steel requirements.

STRUCTURAL DECK. After tough-temper Tufcor sheets—80,000 psi and stronger—are welded in place, they help stiffen framing, provide an immediate work platform for trades. Tufcor easily withstands normal construction abuse.

EFFECTIVE INSULATION. Because insulating concrete is inert, it is one of the most permanent, desirable types of roof insulation. Thickness of concrete fill placed on Tufcor can be varied to obtain desired insulation.

BUILT-UP ROOF. Rigidity and firmness of the Tufcor system provide a firm base for built-up roof, add years to the life of this roof, lower maintenance cost. Fast construction means faster profits from occupancy.


OUTSIDE TEMP. 0° F.
BUILT-UP ROOF
INSULATING CONCRETE...
TUFCOR VAPOR BARRIER
TUFCOR PREVENTS WARM INSIDE AIR FROM RISING TO COLD ROOF ABOVE AND CONDENSING
INSIDE TEMP. 70° F.

VAPOR BARRIER. Water vapor can't penetrate Tufcor. Sheets stay dry, maintain insulating properties, cut fuel bills. Firesafe Tufcor roofs need fewer sprinklers. Insurance savings, alone, often pay for the entire roof deck in 10 years!

FOR MORE INFORMATION, contact Granco home or district office, ATTN: Dept. E-72.

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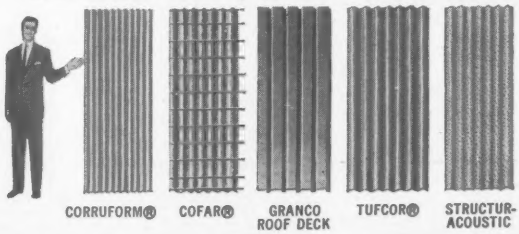

. . . Labor

America is attempting to win back some of its former members in the Federation of Honeywell Engineers that recently disaffiliated with ESA to join UAW (ENR Apr. 4, p. 155).

Under the new UAW program, engineers and white collar workers will be directly represented on the union's bargaining committees at the local and national levels and may supplement master agreements with special contracts tailored to meet their own problems. According to current estimates, UAW has between 70,000 and 80,000 engineers, technicians and office workers among its 1,385,000 members. As a further aid in unionizing engineers, scientists and technicians, the UAW recently formed an Aircraft & Avionics Engineering Council.

ESA, a collective bargaining organization of professional engineers and scientists, meanwhile intervened in the Honeywell situation and will match its lure against the UAW in a new certification election for the Honeywell group. Prior to that election, the engineers will have a chance to vote on representation separate from that of the non-professionals. In the words of ESA President Joseph Amann, UAW membership "would prove a detriment rather than an asset from the standpoint of enabling an engineer or scientist to discharge his responsibilities to himself and to his profession."

The UAW action, which the union said will not weaken the principle of industrial unionism, followed a week of convention proceedings largely devoted to improving the democratic processes within the union and to the elimination of corruption from union ranks. Walter Reuther, who called for public investigation of crookedness in management as well as in labor, was unanimously re-elected union chief.

Labor Briefs . . .

• **Jurisdictional dispute**—Millwrights on a J. A. Jones Construction Co. project at the Hanford Atomic Works near Richland, Wash., were off the job nine days in a work dispute with electrical workers. Reassignment gave millwrights the job of installing electric motors but left electrical workers the job of removing anchor bolts from the motors.

• **Too good to lose?**—Teamsters have effectively supported picketing by carpenters in Jeffersontown, Ky., by refusing to deliver materials needed in the construction of a city sewerage disposal plant. Project contractor Coleman Trainer & Co., which employs nonunion men, has obtained a temporary injunction against the carpenters.

OFFICIAL PROPOSALS

Bids: May 27, 1957.

Construction of a Sewer System Hellertown Borough Authority

Sealed proposals will be received by the undersigned at BOROUGH COUNCIL CHAMBERS, BOROUGH HALL, 685 MAIN STREET, HELLERTOWN, NORTHAMPTON COUNTY, PENNSYLVANIA until 7:30 P. M. Eastern Standard Time, Monday, May 27, 1957, at which place and time or shortly thereafter they will be publicly opened and read, and shall cover furnishing all necessary labor, materials and equipment, and performing all work for the "Construction of a Sewerage System" for the Hellertown Borough Authority. Each proposal shall be accompanied by a certified check or bid bond in an amount not less than ten percent of the bid total, all in accordance with the provisions contained in the Contract Documents.

Copies of the Contract Documents, including Drawings and Specifications, may be obtained only from the office of LEONARD M. FRAIVILLIG COMPANY, ENGINEERS, 633 MAIN STREET, BETHLEHEM, PENNSYLVANIA, at which place copies will also be on hand for inspection by prospective bidders, and material and equipment supplies. Not more than two (2) sets of a particular Contract will be allowed to any prospective bidder.

Checks for all deposits shall be drawn payable to LEONARD M. FRAIVILLIG COMPANY and sent to their address as indicated above. Deposit for each set requested shall be as follows:

CONSTRUCTION OF A SEWERAGE SYSTEM $90.00

Full refund will be made only to actual bidders on the above noted Contract, for return of one (1) set not more, of the Contract Documents in good condition within fifteen (15) calendar days after closing date for receipt of bids; refund for return of all other sets in good condition within the same period, will be fifty (50) percent of deposit. No refund of deposit will be made for Contract Documents returned later than fifteen (15) calendar days after date of receipt of bids.

Copies of the Contract Documents, including Drawings and Specifications will be on file, for inspection purposes only, at Borough Hall, 685 Main Street, Hellertown, Pennsylvania, but none can be obtained from the above mentioned place.

Leonard M. Fraivillig Company
Engineers
Bethlehem, Pennsylvania
Hellertown Borough Authority
Hellertown
Northampton County
Pennsylvania

Bids: May 21, 1957.

City of Richmond, Virginia

NOTICE TO BIDDERS

Sealed Proposals will be received at the office of the Director, Purchases and General Services, 4th floor, Mosque Building, Laurel and Main Streets, Richmond, Virginia, until but not later than 11 o'clock A. M. E.S.T., May 21, 1957, at which time they will be publicly opened and read aloud, for the following work which may be awarded in whole or in part:

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division V—Outside Piping and Miscellaneous Structures", and comprises the furnishing of all labor, materials, equipment and work incidental thereto for the construction of the sludge beds, sludge lagoons, outside piping, railroad siding and miscellaneous structures, as shown, specified and directed.

Location: The Outside Piping and Miscellaneous structures will be located at the site of the Sewage Treatment Plant, adjacent to the southwest bank of the James River at Rockett's Wharf, northeast of the United States Naval Diesel School, in the City of Richmond, Virginia.

The proposal and other contract documents may be examined at the office of the Director of Public Works, 217 Governor Street, Richmond, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of the contract documents may be obtained from the office of the Director of Public Works upon the deposit of Twenty-Five Dollars for each set. Any general contractor who submits a bona fide bid on the project will be refunded his payment in full for not more than three sets, and will be refunded fifteen dollars per set for each additional set. All others will be refunded fifteen dollars per set upon the return of the documents in good condition within ten days after the opening of the bids.

J. W. Huffman
Director of Purchases and
General Services

Bids: May 17, 1957.

Advertisement — Notice to Contractors for 1,000,000 Gallon Capacity Steel Standpipe for Niskayuna Water District No. 5 Niskayuna, New York

Sealed bids for a 1,000,000 Gallon Steel Standpipe together with Foundations, Valve Chamber, Piping, Valves and Appurtenances for same will be received at the office of the Town Clerk, in the Town Hall on Balltown Road on the 17th day of May 1957, at 2:00 o'clock, P. M., Eastern Daylight Saving Time, and then at said office publicly opened and read aloud.

The work will consist of a 1,000,000 gallon capacity steel standpipe, concrete pile foundations and valve chamber for same: cast iron pipe, cast iron specials, valves and appurtenances to supply the tank, regulate its operation and connect it to the water distribution system of Niskayuna Water District No. 5.

The Information for Bidders, Form of Contract, Plans, Specifications and Form of Performance Bond may be examined at the office of the Town Clerk, Town of Niskayuna, New York, and at the office of Keis & Holroyd, Consulting Engineers, 25 Broadway, Troy, New York. Copies thereof may be obtained at the said office of the Town Clerk or Keis & Holroyd upon payment of $25.00 for each set. Any bidder upon returning such set promptly in good condition, will be refunded his payment and any non-bidder upon so returning such set within thirty days of date for receiving bids, will be refunded $20.00.

The Town Board, Niskayuna, New York, reserves the right to waive any informalities in or to reject any or all bids.

A certified check made payable to the order of the Supervisor of the Town of Niskayuna, New York, or bid bond in amount of 5% of the bid must be deposited by each bidder with his bid as a guarantee that in case a contract is awarded to him, that he will, within 5 days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so, he shall forfeit the deposit as liquidated damages and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder.

The successful bidder or bidders will be required to furnish a performance bond or bonds satisfactory to the Town Board of Niskayuna, New York, in the amount of the contract, and having as surety thereon such surety company or companies as are acceptable to the Town Board of Niskayuna, New York.

No bidder may withdraw his bid within 30 days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

EDMOND C. DUNN
Town Clerk

CONTRACTORS
WATCH
THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record P.O. Box 12 New York 36, N. Y.

Bids: May 1, 1957

Power Authority of the State of New York Advertisement For Proposals For Construction of Richards Landing Dike

SPECIFICATIONS NO. PA-5-11026
ST. LAWRENCE CONTRACT NO. 34

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the completion of the construction of Richards Landing Dike, near Massena, St. Lawrence County, New York, until 10:30 A.M., Eastern Daylight Saving Time on the 1st day of May, 1957, 270 Broadway, Room 1305, New York, New York, at which time and place proposals will be publicly opened and read aloud.

The principal items of work are estimated to be:

513,650 cu. yds. of excavation and embankment
39,600 cu. yds. of dumped quarried riprap
13,000 cu. yds. of crushed rock or gravel blanket under riprap
6,380 cu. yds. of crushed rock or gravel base
23 acres of topsoiling
27 acres of seeding

The excavation and rough grading of Massena Town Beach Area shall be completed on or before August 1, 1957. All work shall be completed on or before December 1, 1957.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten dollars ($10.00) per initial set and Five dollars ($5.00) per set for additional sets, no part of which will be refunded.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

PA-5-11026

W. S. Chapin
General Manager

Bids: April 23, 1957

West Delaware Tunnel Contracts 454 and 455

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, April 23, 1957, for the following two contracts for the construction of the easterly portion of the West Delaware Tunnel of the Delaware system, comprising about 19 miles of concrete lined pressure tunnel, circular in section and 11 feet 4 inches in finished diameter, and Shafts 5 to 7 inclusive, 14 feet in diameter, which will be circular in section and lined with concrete, all as set forth in the specifications:

CONTRACT 454, for the construction of about 60,000 linear feet of tunnel, including Shaft 5, approximately 760 feet deep, and Shaft 6, approximately 780 feet deep, located in the Towns of Rockland and Neversink, Sullivan county, New York.

CONTRACT 455, for the construction of about 42,000 linear feet of tunnel, including Shaft 7, approximately 650 feet deep, and the tunnel outlet, located in the Town of Neversink, Sullivan county, New York.

A bidder on both of these contracts may, if he so desires, specify in the bid form of either or both contracts, that he will agree to make a percentage reduction from the total cost of the contract, if both contracts are awarded to him.

Pamphlets of the two contracts containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1312 at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: April 25, 1957

Soil Explorations and Foundation Investigation

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, Albany, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Eastern Standard Time, on April 25, 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATION AT VARIOUS SITES ON SPRAIN PARKWAY-BRONX, RIVER PARKWAY, YONKERS AVENUE TO JACKSON AVENUE, WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-100.

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATION AT VARIOUS SITES ON NEW ROCHELLE ARTERIAL, STRUCTURE OVER NORTH AVENUE, WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-102.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. K. G. Rauer, District Engineer, New York State Department of Public Works, Pleasant Valley Road, Poughkeepsie, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for each set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for SM.100 work is $2,205.00. The Engineer's Estimate of cost for SM.102 is $2,700.00. Proposal for each contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. Johnson
Superintendent of Public Works

Bids: April 25, 1957

Soil Explorations and Foundation Investigation

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Eastern Standard Time, on April 25, 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATION AT VARIOUS SITES ON ULSTER-DELAWARE, PART 3, SH 31, VIADUCT AT BIG INDIAN, ULSTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-101.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. K. G. Rauer, District Engineer, New York State Department of Public Works, Pleasant Valley Road, Poughkeepsie, New York.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $10,650.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. Johnson
Superintendent of Public Works

U. S. Government

COMMONWEALTH OF MASSACHUSETTS. Department of Public Works. NOTICE TO CONTRACTORS: Sealed proposals for constructing a section of J. F. Fitzgerald Expressway on reinforced concrete viaduct from Dover Street to Union Park Street (approximately) in the City of BOSTON F. A. No. I-352(2) Contract N, will be received at Room 427, 100 Nashua Street, Boston, Mass., until 2:00 P. M. (DST) of TUESDAY, MAY 7, 1957, and at that place and time publicly opened and read. Proposal guaranty: $200,000. Charge for plans and proposal forms: $25.00, amount returnable only to bidders. Complete information at said office. Minimum wage and dump-truck rates have been established. Right reserved to waive any informality in or reject any or all proposals. An award will not be made to a Contractor who is not equipped to undertake and complete the work.
By: CARL A. SHERIDAN, Commissioner of Public Works.
April 6, 1957.

OFFICIAL PROPOSALS

Bids: May 3, 1957

Swift Hydroelectric Project No. 2

ADVERTISEMENT FOR BIDS

Notice is hereby given that sealed bids for construction of the powerhouse, power canal and associated structures for Swift Hydroelectric Project No. 2 on the Lewis River in Skamania and Cowlitz Counties, Washington, will be received at the office of Public Utility District No. 1 of Cowlitz County, Washington (hereinafter referred to as the District), 1421 Fourteenth Avenue, Longview, Washington, until 3:00 P.M., Pacific Standard Time, May 3, 1957, and read at that time.

The work includes furnishing all plant, materials, equipment supplies, labor and transportation, including fuel, power and water (but excepting any materials, equipment, utilities or services, if any, specified by the contract documents to be furnished by the District) and performing all work in accordance with the specifications, schedules and drawings of the contract documents and drawings for:

a. Completion of approximately 3½ miles of power canal from near Powerhouse No. 1 to Powerhouse No. 2.
b. Construction of wasteway structure and check structure.
c. Construction of intake structure.
d. Construction of penstocks.
e. Excavation of discharge channel in Lewis River.
f. Relocation of existing public road, construction of access road, and construction of relocated public road canal crossing.
g. Construction of a powerhouse building approximately 60 feet by 144 feet with reinforced concrete substructure and structural steel superstructure.
h. Concrete tailrace lining.
i. Installation of cabinet actuator governor, complete with oil pressure tanks, air compressor, and oil piping.
j. Installation of a 225-ton indoor bridge crane.
k. Installation of two 46,000 horsepower Francis turbines complete with welded steel spiral cases, automatic lubrication system, piping, wiring, and accessory equipment within or on the turbines.
l. Installation of two 38,889 kva 128.6 rpm indoor generators, complete with bearings, exciters, piping, wiring and all apparatus within or on the generators.
m. Installation of two 14'-0"x15'-11" fixed-wheel type intake gates, complete with gate frames, guides, hoist supporting tower, hoist machinery and control equipment.
n. Installation of two (2) 45000 kva, 3-phase, main power transformers complete with all piping, control and appurtenances.
o. Installation of isolated phase bus.
p. Installation of 300 kva, 3-phase, emergency auxiliary power transformer and 75 kva, 3-phase, lighting transformer (inductrol).
q. Installation of all switchboards, equipment and control cubicles, and cabinets, motor control centers, and miscellaneous items of power and control equipment.
r. Installation of 480-volt unit substation (2 incoming line sections, 2 - 500 kva transformer sections and 480-volt switchgear section).
s. Installation of grounding system (powerhouse and intake area).
t. Installation of all conduit and cable trays for power and control circuits.
u. Installation of all wire and cable for power and control circuits.
v. Installation of lighting system complete.
w. Installation of auxiliary powerhouse equipment including pumps, air compressors and receivers, water and oil tanks, CO_2 system, and associated piping, ordinary valves, controls, conduits.

The approximate quantities of major items of work are: 900,000 cubic yards of canal excavation; 2,300,000 cubic yards of canal embankment; 175,000 cubic yards of common powerhouse excavation; 90,000 cubic yards of rock powerhouse excavation; and 30,000 cubic yards of concrete. Drawings and contract documents are on file at the office of the District and may be obtained from the Bechtel Corporation offices, 4620 Seville Avenue, Vernon, California, Attention: J. G. Patrick, Project Engineer. $25.00 per set deposit is required on drawings and contract documents. Examination of drawings and contract documents may also be made at the office of the District and at the Bechtel Corporation office, Room 812, 220 Bush Street, San Francisco, California.

Such bids shall be submitted in duplicate on official bid forms without interlineation or erasure and must be filed in a sealed envelope addressed to the Commission of the District and plainly marked on the outside "Bid under Specification No. 1 for Construction of Swift Hydroelectric Plant No. 2", at the office of the District in the Public Utility District building in Longview, Washington, on or before 3:00 o'clock P.M., May 3, 1957, and all bids received will then and there be publicly opened, read and canvassed. Such bid shall continue in effect and constitute an offer on the part of the party submitting such bid until 5:00 P.M., Pacific Standard Time, June 17, 1957. Thereafter any bidder may withdraw his bid, but any such withdrawal shall become effective only upon receipt of a written notice of withdrawal by the Commission, addressed to Commission, Public Utility District No. 1 of Cowlitz County, 1421 Fourteenth Avenue, Longview, Washington.

Each bid shall be accompanied by a certified or cashier's check, payable to the order of the Commission, for a sum not less than 5% of the amount of the bid, or accompanied by a bid bond on the form provided in an amount not less than 5% of the bid with responsible corporate surety or sureties licensed to do business in the State of Washington, conditioned that the bidder will pay the District as liquidated damages the amount specified in the bond unless he enters into a contract for construction in accordance with his bid and furnishes the performance and payment bond herein mentioned within ten (10) days from the date on which he is notified that he is the successful bidder and receipt by bidder of contract for signature.

The District reserves the right to accept or reject any or all bids or parts of any bid received.

If the offer of one of the bidders be accepted by the District, such successful bidder shall be notified of such acceptance by the District in telegraphic form, filed in an established office of the Western Union Telegraph Company, addressed to the successful bidder at his place of business for transmission as a regular unchannelled telegram.

Any acceptance of bid and award of contract shall be contingent upon and subject to the sale and delivery of Revenue Bonds in an amount sufficient to provide the District with the necessary funds to complete all obligations of the District for its costs in connection with the construction of Swift Plant Nos. 1 and 2 and related facilities.

If a contract be let, all checks or bid bonds shall be returned to unsuccessful bidders and the check or bid bond of the successful bidder shall be retained until a contract shall be entered into and a bond furnished for the faithful performance of the work, including full payment of all labor and material furnished by the Contractor, with a surety or sureties satisfactory to the Commission, in an amount equal to one hundred percent (100%) of the contract price, in accordance with the bid. If such bidder fails to enter into the contract in accordance with the bid and tract documents and to furnish such bond within ten (10) days from the date at which he is notified that he is the successful bidder and receipt by bidder of contract for signature, his check or bid bond and the amount thereof shall be forfeited to the Public Utility District.

Dated this 2nd day of April, 1957.

PUBLIC UTILITY DISTRICT NO. 1
OF COWLITZ COUNTY, WASHINGTON
COMMISSIONERS
Earl J. Cole, President
E. T. Cooney, Vice President
Frank Jaeger, Secretary

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4890) will be received at Loveland, Colorado, until May 9, 1957, for furnishing labor and materials for Big Thompson Powerplant and Switchyard, Colorado-Big Thompson Project, Colorado. Location near Loveland, Colorado. Principal items are 11,350 cu. yds. excavation; 1,260 cu. yds. concrete; furnishing and placing 165,000 lbs. reinforcement bars; furnishing and erecting 42,000 lbs. structural steel; furnishing and installing steel penstock; installing and testing one 6,300-hp hydraulic turbine; installing one generator and main exciter; installing power transformer; and other work. Completion time 770 days. For particulars, address Bureau of Reclamation, Building 46, Denver Federal Center, Denver 2, Colorado; P. O. Box 449, Loveland, Colorado; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: May 7, 1957

Power Authority of the State of New York Barnhard-Plattsburgh Transmission Project

ADVERTISEMENT FOR PROPOSALS FOR THE FURNISHING AND DELIVERY OF STRUCTURAL STEEL FOR SUB-STATIONS
SPECIFICATIONS NO. PA-6-38
CONTRACT NO. TP7

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the shop detailing, fabrication, and furnishing of structural steel for the substations for the Barnhart-Plattsburgh Transmission Project and delivery thereof.o.b. destinations, until 10:30 A.M., Eastern Daylight Saving Time, on the 7th day of May, 1957, at the Authority's office, 270 Broadway, Room 1305, New York, New York, at which time and place the proposals will be publicly opened and read aloud.

Bids will be received for the structural steel for the Plattsburgh and Kents Falls Substations in accordance with the bidding schedules. Estimated quantity for Plattsburgh Substation 80 tons; for Kents Falls Substation 45 tons. Erection at the site of installation will be done by Others. Delivery will be required starting September 15, 1957.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts; may be inspected by prospective bidders during office hours; and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) Dollars per initial set of contract documents and Five ($5.00) Dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids will not be restricted to American Manufacturers.

Bids must be made in duplicate in accordance with the instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than ten per cent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: May 6, 1957

New Dam on Fish Creek

CITY OF ROME, NEW YORK
ADVERTISEMENT

Sealed bids will be received by the Purchasing Agent of the City of Rome, City Hall, Rome, New York until 3:30 p.m. Local Time on May 6th, 1957 for the construction of a concrete masonry dam and accessories, said dam to be located on the east branch of Fish Creek approximately 17 miles northwest of the City. The bids will be publicly opened and read at 4:00 p.m. Local Time on May 6, 1957.

All proposals shall be made on forms furnished and shall be enclosed in a sealed envelope marked "New Dam on Fish Creek" and directed to the attention of the Purchasing Agent. Each bid shall be accompanied by a certified check or bidders bond in the amount of five per cent (5%) of the bid payable to the order of the Purchasing Agent of the City of Rome. The successful bidder will be required to furnish a performance bond in an amount equal to the contract award.

Plans, specifications, proposal forms and other contract documents may be examined at the office of the City Engineer, Rome, New York or at the office of Malcolm Pirnie Engineers, 25 West 43rd Street, New York 36, N. Y., and may be secured from said offices at a cost of Twenty-Five Dollars ($25.00) which will be refunded upon return of documents in good condition within ten (10) days after receipt of bids.

The City reserves the right to reject any or all proposals, or to accept any bid deemed to be for its best interest.

By order of Gregory F. Esposito,
Commissioner of Finance
CITY OF ROME, NEW YORK

OFFICIAL PROPOSALS

Bids: April 25, 1957.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Canal Law Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 25th day of April 1957, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Fulton (Rte. 29)	FARC 57-33	Johnstown-Broadalbin, Pt. 2, S.H. 543 Broadalbin-East Galway, S.H. 8045 Project F-340(4)	2.80 (0.79 Acc.)	9" Cem. Conc. Pavt. 24' Wide=2.80 Mi.; Asp. Conc. Opt.=0.58 Mi.; Found. Course Rob Gravel=0.21 Mi.; Hy. Sep. Comp. I-Beam 133.5'	$37,000 Plans $15	$677,000
Oneida (Rte. 233)	FARC 57-34	Kirkland-Rome, S.H. 8246; Rome Roads—Augusta & Westmoreland Sections, S.H. 564. Project F-U-415(10)	4.82	Asphalt Concrete, Ty. 1A	$37,000 Plans $25	678,000
DISTRICT No. 3, W. Robinson, District Engineer, Weigh Lock Building, 301 E. Water St., Syracuse, N. Y.						
Cayuga, Cortland, Onondaga, Oswego, Seneca, Tompkins, Wayne	RC 57-32	Twenty Various State Highways in District No. 3	36.25	Subsealing Cement Concrete Pavement	$13,000 Plans $10	236,000
Onondaga (Rte. 5)	FARC 57-9	Fayetteville Village: Genesee Street, S.H. 5660 Project F-329(7)	0.25 (0.11 Int.)	9" Cem. Conc. Pavt. 50' Wide=0.12 Mi.; Asp. Conc. Ty. 1A=0.24 Mi., Comp. I-Beam Br. 260.5'	$26,000 Plans $10	486,000
Oswego	FISH 57-9	Interstate Route 5 (Brewerton-Central Square) (Oneida Lake Bridge). Project I-1118(9)	0.17	Cem. Conc. Pavt.=0.09 Mi.; Asp. Conc.=0.08 Mi.; Superstructure Only for Steel Arch Br. 448'	$108,000 Plans $25	2,004,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, N. Y.						
Genesee (Rte. 33)	FARC 57-22	Crittendon-Corfu, S.H. 8215; Corfu-Batavia, S.H. 8283 Project F-377(12)	13.26	Asp. Conc. Opt. Repair Exist. I-Beam 30'; Repair Exist I-Beam 38'	$65,000 Plans $15	1,186,000
Livingston (Rte. 15 & 20A)	FARC 57-46	Livonia-Lakeville, S.H. 716; Lakeville-East Avon, S.H. 8034. Project F-315(2), F-61(3)	0.34	Asp. Conc.=0.22 Mi.; Misc. Work=0.12 Mi.; Prestressed Conc. Bridge 53'; R.C. Closed Box Bridge 21'	$15,000 Plans $15	268,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court St., Buffalo 2, N. Y.						
Erie (Rte. 324)	FARC 57-35	Sheridan Drive, S.H. 9216 Project U-1123(1)	3.91	Asp. Conc. Ty. 2A=3.85 Mi.; Misc. Work=0.06 Mi.	$82,000 Plans $25	1,486,000
Erie (Rte. 263)	RC 57-37	Skinnersville-New Home Bridge, S.H. 584 Buffalo-Millersport, Pt. 2, S.H. 1949	1.99	Asp. Conc.	$10,000 Plans $10	180,000
Erie (Rte. 5)	RC 57-38	Eighteen Mile Creek, S.H. 5054; Athol Springs-Walden Cliffs, S.H. 5407; Eighteen Mile Creek-Evans Center, S.H. 5546	8.37	Asp. Conc.	$47,000 Plans $10	858,000
Niagara (Rte. 93)	FARC 57-36	Youngstown-Lockport, Pt. 1, S.H. 800 Project S-491(1)	4.79	Asp. Conc.	$18,000 Plans $10	340,000
DISTRICT No. 6, J. H. Thomas, District Engineer, State Office Bldg., 30 W. Main St., Hornell, N. Y.						
Steuben (Rte. 333)	RC 57-43	Campbell-Thurston, Pt. 2, S.H. 903	0.05	Painting & Repairing Existing 232' Truss Bridge	$2,000 Plans $10	38,000
Yates	FATC 57-1	Penn Yan Village, S.H. 5291; Village of Penn Yan, Lake Street, S.H. 9325; Penn Yan-Potter, Pt. 1, S.H. 1596 Project U-146(3)	1.20	Installation of Traffic Signa lSystem	$1,100 Plans $10	20,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee St., Watertown, N. Y.						
Franklin	M-57-5	Saranac River Lower Dam and Lock	....	Install New Flood Gate and Misc. Work	$1,700 Plans $10	31,600
Lewis	M-57-6	Naumburg Canal Bridge Over Beaver River	....	Cleaning and Painting 124.6' Truss Bridge	$180 Plans $10	3,200
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Rensselaer & Columbia	BT 57-1	New York State Thruway—Berkshire Section—Sub. B-3A (Columbia Co. Line to Co. Rd. 27); Taconic State Parkway Interchange; 11 Secondary Cross or Access Rds. & S.H. 827 & S.H. 1933	7.96 (4.76 Acc.)	9" Cem. Conc. Pavt. 2@25' Var. Wide=9.58 Mi.; Asp. Conc. Opt.=0.25 Mi.; Bit. Mac. Ty. 1=2.81 Mi.; Misc. Work=0.04 Mi.; Cal. Chl. Treat. Gravel=0.04 Mi.; 9 Hy. Seps. Comp. I-Beams 197.7', 182', 256.3', 254.3', 153.5', 173.8', 178.4', 386.3' & 440.5'; 4 Brs. Comp. I-Beams 242.5', 242.5', 87' & 87'; 1 Hy. Sep. I-Beam 240.5'; 1 Hy. Sep. Deck Girder 484.5'; 1 RR Sep. Pl. Girder 298'	$770,000 Plans $100	14,000,000
Dutchess	FASS 57-5	Barnegat Road-Spackenkill Road, C.R. 76 Project S-138(2)	2.09	Asp. Conc. Opt. Hy. Sep. Comp. I-Beam 217.5'	$39,000 Plans $15	714,000
Rockland	PIP 57-1	Palisades Interstate Parkway Sec. 2 & Sec. 2 Pt. 1 (N. J. State Line to Rte. 303 and Rte. 59 to Rte. 45)	8.25	Roadside Development	$10,000 Plans $25	182,000
Westchester (Rte. 117)	FERC 57-40	Mount Kisco Village, S.H. 865 Project ER-49(1)	0.11	9" Cem. Conc. Pavt. 24' Wide=0.08 Mi.; Misc. Work=0.03 Mi.; R.C. Closed Box Bridge 24.2'	$5,500 Plans $10	98,000
Westchester	FINETC 57-2	New York State Thruway—New England Sect.—Sub. NE4 (Rye Station Area) Project IN-1068(12) (Cont. 2)	0.89	Modifications to Railroad Facilities & Re-Routing of Communication Lines	$8,000 Plans $25	153,000
Westchester (Rte. 127)	FARC 57-17	Lake Street, Ridge Street and Harrison Avenue, S.H. 1457; White Plains Town Line-Harrison, S.H. 780 Project S-468(1)	0.96	9" Cem. Conc. Pavt. 40' Var. Wide=0.95 Mi. Misc. Work=0.01 Mi.	$29,000 Plans $10	539,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick St., Binghamton 21F, N. Y.						
Sullivan (Rte. 17)	FARC 57-42	Bloomingburg-Monticello Pt. 2, S.H. 5457 & 5457A; Monticello Village, S.H. 5490 & Monticello-Liberty Pt. 1, S.H. 5035. Project F-495(11)	5.40 (10.72 Acc.)	9" Cem. Conc. Pavt. 2@25' Var. Wide=12.72 Mi.; Asp. Conc. Opt.=2.27 Mi.; Bit. Mac. Ty. 1=1.10 Mi.; Misc. Work=0.03 Mi.; 6 Hy. Seps. Comp. I-Beams 213.5', 281.8', 212.8', 252.5', 280' and 206.2'; 1 Reinf. Conc. Slab Bridge 23.5'	$430,000 Plans $100	7,811,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main St., Babylon, Long Island, N. Y.						
Bronx	FICBE 57-1	Cross-Bronx Expressway (Cont. 1E) (University Ave. to Anthony Ave.) Project I-1084(26)	0.98	Demolition of Buildings	$14,000 Plans $10	250,000
Bronx	FIBE 57-1	Bruckner Expressway Sect. 1 (Cont. 4A & 4B) (E. 133d Street to Hunts Point Avenue) Project I-1086(4)	1.90	Demolition of Buildings	$7,000 Plans $10	136,000
Kings	FIBQE 57-1	Brooklyn-Queens Expressway Cont. 18 (Concord St. to Flushing Ave.) Project U-I-1066(20)	1.17 (0.73 Acc.)	Asp. Conc. Ty. 2B=0.91 Mi.; Asp. Conc. Opt.=0.99 Mi. Steel Beam & Girder Viaduct 4804'	$820,000 Plans $100	16,085,000
Nassau & Suffolk (Rte. 109 & 110)	FARC 57-41	Farmingdale-Maywood, S.H. 9077; Maywood-Babylon & Pt. 2, S.H. 1841-8499; Huntington-Amityville Pt. 2, S.H. 1219 Project U-985(9)	4.53 (1.19 Acc.)	9" Cem. Conc. Pavt. 2@34' Var. Wide=2.12 Mi.; Asp. Conc. Opt.=1.59 Mi.; Misc. Work=2.01 Mi.	$96,000 Plans $25	1,749,000
Nassau & Suffolk (Rte. 25)	RC 57-44	Jericho Turnpike-Plainview Road, S.H. 436; Jericho Turnpike Pts. 2 & 3, S.H. 5111-5112; Smithtown Branch-Coram, S.H. 8268 & Greenport-Orient Point 2, S.H. 8380	1.31	Drainage & Misc. Work	$28,000 Plans $10	510,000
Suffolk (Rte. 24 & 25)	RC 57-45	Jericho Turnpike, S.H. 5008; Jericho Turnpike Pt. 3, S.H. 5112; Smithtown Branch-Coram, S.H. 8268; Farmingdale-Riverhead Pt. 1, S.H. 9065	2.08	Drainage & Misc. Work	$26,000 Plans $10	470,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: April 25, 1957

Crompond School
Yorktown Heights, N. Y.

NOTICE TO BIDDERS FOR ALL CONTRACTS

Sealed proposals for the construction of the Crompond School, Yorktown Heights, New York, will be received by the Board of Education, Central School District No. 2, Towns of Yorktown, New Castle and Cortlandt, Westchester County, New York, at the Yorktown Heights High School Auditorium until 8:00 o'clock P.M., E.S.T. on April 25, 1957, at which time and place the proposals will be publicly opened and read.

Separate proposals will be received for the following work:

Contract No. 1—General Construction
Contract No. 2—Plumbing
Contract No. 3—Heating & Ventilating
Contract No. 4—Electrical
Contract No. 5—Site Development

Forms of Proposal, Drawings, Specifications and other Contract Documents may be obtained on or after March 29, 1957, by each bidder on Contracts No. 1, 2, 3, 4 and 5 at the office of the Architects, Ferrenz & Taylor, 152 West 42nd Street, New York 36, New York. One complete set of General Construction, Plumbing, Heating & Ventilating, Electrical and Site Development, will be furnished to each bidder upon receipt of a deposit check made payable to the Architects for the amount of Fifty Dollars ($50.00).

Deposits will be refunded upon return of the documents in good condition within 30 days after opening of bids provided that a proposal has been submitted. Deposit shall be forfeited in case of failure to submit a proposal. Additional sets or portions thereof may be obtained by any bidder upon payment of the actual cost of reproduction.

Proposals shall be made and received upon the following conditions:

Each bid must be accompanied by cash or a certified check, made payable to the Board of Education, or a bid bond. The amount of such bid security shall be five (5%) percent of the amount of the bid, as a guarantee that in case the contract is awarded to the bidder, he will within ten days thereafter execute the contract and furnish a satisfactory payment and performance bond. Upon failure to do so the Board of Education will retain for its own account the bid security or will default the bid bond as liquidated damages. Bid bonds in the form incorporated in the contract documents or other standard forms will be acceptable.

The cash or checks of all except the three lowest bidders will be returned within three days after the opening of the bids, and the remaining cash or checks will be returned when the contract is executed, or in any event within forty five days after the opening of the bids. No bid may be withdrawn within forty five days after the opening thereof.

The successful bidders will be required to furnish a payment and performance bond in the form incorporated herein, and with a surety or sureties satisfactory to the Board, which bonds shall be in the amount of the contract.

The time for completion shall be stated by the bidder in his proposal.

The Board of Education reserves the right to reject any or all bids and to waive any irregularities, or to accept any proposal by any bidder which in the opinion of the Board of Education will be in the best interest of the board.

March 28, 1957

Board of Education
Central School District No. 2
Towns of Yorktown, New Castle
and Cortlandt, Westchester County,
New York.

By Bertha Smith, Clerk

Bids: April 29, 1957

Dock Facilities

Alabama State Docks Dept., Constr. Inland Waterways Dock Facilities, 1st. Incr. Circular Sheet Pile Docks with Fenders. Plans Deposit $25.

John J. Harte Co.
Box 2192.
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Highway and Bridge Engineers, Designers. Experienced, for Permanent Positions in our New York Office. Excellent Salary Plus Overtime. Air mail resume to Farkas & Barron, Consulting Engineers, 5 Beekman Street, New York 38, N. Y., or call BEekman 3-8387.

Wanted: Paving and dirt Superintendent for long established New York contractor operating in New York and adjacent states. Salary commensurate with experience and—ability. P-4670, Engineering News-Record.

Structural Design Engineers and Graduate Civil Engineers—to design and detail buildings of all types. Excellent opportunities. Salary will depend on experience and ability. Replies will be treated confidentially. Ammann & Whitney, Milwaukee Office, 724 East Mason Street, Milwaukee, Wisconsin.

Superintendent for all phases Asphalt Highway Construction in Arkansas. Hot Asphalt Plant Operation experience necessary. Position permanent. Salary open. Reply: Personnel, P. O. Box 2660, Little Rock, Arkansas.

Graduate Civil Engineer or equivalent experience to assist City Engineer, location North-Central Indiana, salary $5,200-$6,500. Please give experience and full details in reply. P-4680, Engineering News-Record.

Position open for Junior College Instructor in Drafting and Engineering Drawing. Apply, Director, Coalinga College, California.

Engineer—experienced. For medium sized contracting firm engaged in heavy construction, principally highways, airports, bridges, interested in intelligent, ambitious engineer. Duties would include engineering layout for excavations, paving and structures; estimating proposed jobs; and computing quantities of work done. Would touch on all operations of company and lead to executive position for right man. Salary open. Reply by letter giving resume of education, experience and references. East. P-4762, Engineering News-Record, 520 North Michigan Avenue, Chicago 11, Illinois.

Engineering Graduate with experience in the testing and control of concrete, asphalt and soils for work abroad. Give full details of experience and education. Salary range $8000 to $10,000 per year. P-4835, Engineering-News Record.

POSITIONS VACANT

Chief of Party—Must be capable of handling survey parties and have thorough understanding of survey work pertaining to rights of way, curb and street lines, sanitary and storm sewer surveys, and general survey work. Apply by appointment—Office of Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

Structural Engineer for responsible charge of important design work, with experience in marine structures, steel fabrication practice. Salary $800 up, depending on qualifications. P-4696, Engineering News-Record.

Designer—draftsmen with several years experience in the design of sewage treatment plants, pumping stations and related structures. Excellent opportunity with growing firm in City in Upstate New York. Salary commensurate with ability. Paid vacations, holidays, hospitalization. Our employees know of this ad. P-4729, Engineering News-Record.

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Associate Professors, Assistant Professors, or Instructors, (rank and salary determined by training and experience) to teach in the Department of Engineering Drawing, which administers courses in Graphics, Engineering Mechanics, and Engineering Orientation. Year round opportunities for participation on research which replaces part of teaching load during the academic year. Apply to Professor Carson P. Buck, Chairman, Department of Engineering Drawing, Syracuse University, Syracuse 10, N. Y.

Engineers — Architects — Draftsmen, Experienced in design and supervision of construction on water works, sewers and general building construction. State experience, age, salary requirements and earliest date available. P-4813, Engineering News-Record.

Associate professor for transportation and soils engineering in C.E. Dept. of large eastern metropolitan university. Probable starting salary in neighborhood of $7,500 for nine months depending upon qualifications. P-4805, Engineering News-Record.

Civil Engineer with experience in prestress concrete design to locate permanently with fifty year old firm now in production of prestress members. If necessary will train. State experience, references and educational resume. The Dextone Company, P. O. Box 606, New Haven, Connecticut.

Teaching position in civil engineering and/or mechanics starting next September. Salary and academic rank dependent on qualifications. Salary up to $7,500.00. Location New York State. P-4840, Engineering News-Record.

(Continued on opposite page)

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to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

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Career opportunities for men interested in professional recognition.
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Air Mail Resume TO R. L. SHAW, *Personnel Director*

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Large Progressive Industrial Concern wants best man obtainable, with proved ability to take full responsibility for all company construction, including Heavy Concrete—Steel—and Machinery Installation. If you have come up through the field, and your past earnings have been $15,000 or more per year and are able to assume greater responsibility—Here is your real opportunity. No traveling—Permanent position with real future. Company pays your fee. No obligation to you. Strictly confidential. Send complete record, write for application, or phone Harrison 7-2913. E. C. Allen; Director—Established 1915.

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First Class Structural Engineer wanted for large fabricating plant in the Southwest, fabricating steel for mill and tier buildings and all types of highway, turnpike and expressway projects.

Applicant should be about 35-40 years old with about 15 years experience in detail drafting office. Requirements of college graduate or registered engineer are not essential provided applicant has sufficient education and experience to qualify as a registered engineer.

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Enclose complete resume of personal history, education and experience.

P-4689, Engineering News-Record,
520 N. Michigan Ave., Chicago 11, Ill.

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- Piping
- Mechanical

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Our Metals, Refinery and Industrial Divisions offer you wide choice of opportunity to make full use of your talents, with excellent prospects for promotion to supervisory, staff and executive posts.

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POSITIONS VACANT

Continued from opposite page

Structural engineer for building design. Ketchum and Konkel, Consulting Engineers, 1090 Fox Street, Denver 4, Colorado.

Assistant Professor to teach mechanics and/or civil engineering starting next September. Salary $6,500.00 Ph.D. desirable. Location New York State. P-4839, Engineering News-Record.

Designers - Electrical - Piping - Struct. Power Plants and Industrial Buildings. Marbarry Corp. 120 Greenwich St., New York City 6, N. Y. REctor 2-3749.

Engineer — Superintendent — Interceptor Sewer Project in Pittsburgh area. Good arrangement for right man. Must be experienced. Send qualifications and references in first letter. P-4859, Engineering News-Record.

Mechanical or Civil Engineer position available recent graduate who prefers the diversified responsibilities of staff position with a well established growing business. Write P-4857, Engineering News-Record.

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Estimator with general supervisory experience and engineering background to become Number Two to medium-sized Virginia building contractor. P-4867, Engineering News-Record.

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Concrete bar detailers and estimators wishing to become sales engineers and chance of advancement to District Managers—must be experienced. Chicago, Birmingham, Pittsburgh, Philadelphia. P-4707, Engineering News-Record.

Structural Steel Detailers, Checkers and Sales Engineer Position. Open. Location center of Eastern Oklahoma resorts area. P-4892, Engineering News-Record.

(Continued on page 190)

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Highway Engineer with 8 to 12 years experience in design and administration. Must be able to assume heavy responsibility. Excellent opportunity with established consulting engineering firm in Middle West. Must be registered.

P-4635, Engineering News-Record,
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PROJECT MANAGER
PROJECT ENGINEER
For overseas project

Should have engineering degree plus extensive experience as project manager or project engineer on overseas installations.

Must be available on 30 days notice. Husband & wife quarters. Salary commensurate with background.

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P-4663—Eng. News-Record
Class Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

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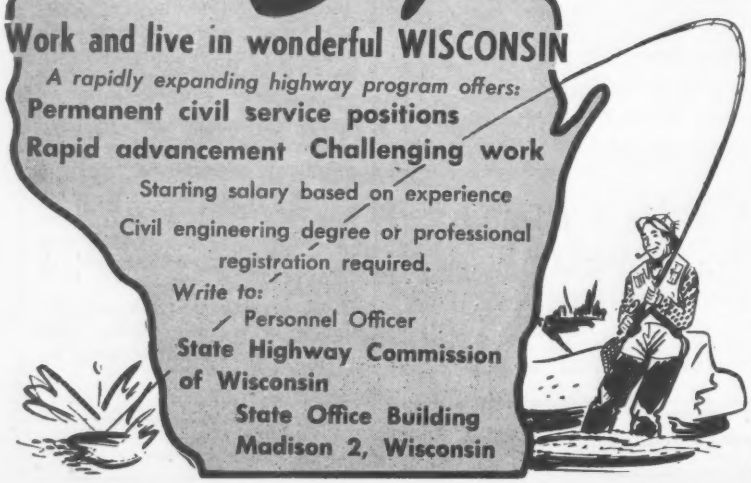

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P-4228—Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

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Engineers with advanced degree required. Prefer men with considerable practical experience in highway soils and foundation practices. Would also be interested in person for summer work now teaching these subjects at graduate level. Positions are top-level professional opportunities with appropriate earnings. Location midwest. Send resume to:

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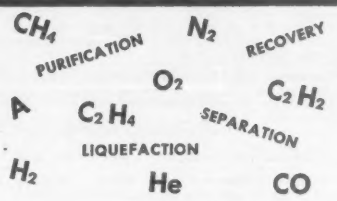

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- Construction Engineers
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Position with expanding company, marketing on a nation-wide basis. Requires experience in testing and evaluation of steel and concrete. Ability to organize, conduct, and evaluate testing programs for product development work or material investigation. Liberal bonus plan and fringe benefits. Salary commensurate with ability. Midwestern location with excellent living conditions available. Send resume to: Mr. H. C. Smith, Granite City Steel Company, 20th & Madison Avenue, Granite City, Illinois.

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Graduation from a college or university of recognized standing with a degree in engineering, specializing in structural engineering, and 3 years experience in a responsible capacity involving design of all sizes and classes of buildings and structures or an equivalent combination of experience and training. Salary $6136-$7436 per year.

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Rock Supt. or Drill Foreman, 25 yr. experience in heavy construction, available now, will travel, references. PW-4673, Engineering News-Record.

Crew of Engrs. & Draftsmen—Elec. Mech. Civil—completing 18 mo. petro-chem plant design. Available individually or as group. Box 2004, Borger, Texas.

Mechanical Engineer — Age 31 — contracts manager, project engineer—supervisor machinery and mechanical equipment installation. 8 years experience heavy construction foreign and domestic, field and office. Excellent references. Seeking opportunity N.Y.C. or vicinity metropolitan area. PW-4764, Engineering News-Record.

Superintendent Construction over 20 yrs. experience, varied projects, industrial to high class finish. Engineer. Anywhere. PW-4742, Engineering News-Record.

Project Mgr. — Superintendent, heavy & bridge construction, fully qualified in all phases, 20 years exp. $200. PW-4810, Engineering News-Record.

Construction Manager, age 45. Wide experience in general contracting field as superintendant, general superintendent. Presently employed, desire change. Minimum $17,000. Prefer midwest location. PW-4815, Engineering News-Record.

Mechanical Engineer, Registered PE, 9 years broad experience, seeks overseas position. PW-4784, Engineering News-Record.

Construction Supt., ready for next step up. 12 yrs. exp., specializing in concrete, comm. and ind. const. Eng. background, B.A. deg. Will relocate anywhere. Excellent ref. PW-4785, Engineering News-Record.

Chief Estimator—Age 31—B.S.C.E. Capable of handling job from bid to completion. Experienced industrial, commercial and institutional. Excellent record. PW-4789, Engineering News-Record.

Contractors Engineer, P.E., 33, experienced in broad phases of building construction desires affiliation with foresighted building and/or heavy construction contractor where he might use his ability and ambition to their mutual advantage. PW-4781, Engineering News-Record.

Civil Engineer, applying for Associate Member, ASCE; M.S. in C.E.; Associate Professor; 29; married. 5 years practical exp. (Europe) in structural design and supervision of Reinforced Concrete, Prestressed Concrete & Steelwork; 1 year teaching (U. S.). Available Oct. 1st. PW-4877, Engineering News-Record.

Paving Engineer-Asphalt Specialist — Licensed professional Engineer heavy experience in paving and asphalt uses; also paving and asphalt research—seeks managerial position U. S., or Europe, Asia, Middle East; might consider consulting work. PW-4876, Engineering News-Record.

Civil Engineer, BSCE, PE, age 35. 11 years experience sub-division work including surveying, layout, computing, estimating, design of utilities. Desire administrative or supervisory position in construction or plant engineering. PW-4890, Engineering News-Record.

Concrete and Materials Engineer, registered P.E., 25 years experience in all phases of Concrete and Concreting materials, including being in charge of laboratory testing and field inspection forces. PW-4881, Engineering News-Record.

POSITIONS WANTED

Superintendent, Field Supervision, constructing Industrial, commercial, Institutional, Large Scale Housing, Churches, etc. Desires similar position with reliable organization. 25 years experience, resident of New Jersey. Can travel. PW-4891, Engineering News-Record.

Graduate civil engineer, eight years experience as a construction engineer with a midwestern state highway department. Desire responsible position with firm contracting highway construction. PW-4885, Engineering News-Record.

Personnel Assistant 28, married. Four years experience in interviewing, screening, and recruiting professional and technical help. Industrial, courteous, and personable. Previous experience in timekeeping, budget control, and sales. Will relocate. PW-4882, Engineering News-Record.

Engineer-Estimator, 30, BSCE. Desires responsible position with general contractor. 4 years estimating and administrative experience in municipal, commercial and industrial buildings. 3 years diversified field experience. PW-4870, Engineering News-Record.

Construction manager-engineer, 30. Degree in architecture. Solid experience in design, estimating, project management, both field and office. Desires permanent position West or Southwest. PW-4872, Engineering News-Record.

Estimator, 25 years background in the construction field. Estimating, bidding, buying, subcontract coordination of industrial buildings, Paper Mills, Chemical Plants, Atomic Energy Commission projects, Highways, Bridges, Sewage Treatment Plants and Sewer Lines. Chief Estimator on projects $20,000,000 to $60,000,000. Desire Change. Prefer Southern States location. PW-4862, Engineering News-Record.

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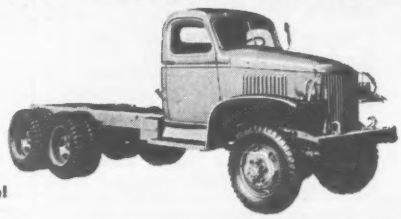

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Where Next for Electronic Computers?

THE FACT that 26 state highway departments and numerous private highway consulting engineers are now utilizing electronic digital computers is proof that these new machines have come of age in the highway field. This progress is the more remarkable since computers were largely unknown to highway engineers prior to 1956. It is, therefore, worth considering why this progress has occurred while at the same time computers are still not widely used elsewhere in civil engineering.

CIVIL ENGINEERS are not slow to adopt new methods, but they are conservative. That this conservatism has been shed in the rush to adopt electronic computers in highway engineering was due to sheer necessity—engineering threatened to become the bottleneck of the $100 billion road program. Moreover, once the decision was made to incorporate these expensive tools, the highway field found it relatively easy going, first because this phase of the construction industry is remarkably cohesive, and second because it is populated by large and well-financed agencies such as the state highway departments and larger than average consulting firms and contractors. Finally, of course, the large amounts of money available for the interstate road program made feasible the large initial expenditures required to get into electronic computer operation.

Unfortunately, these factors are not present to the same degree in other branches of civil engineering. Yet the computer work done by the American Bridge Division of U. S. Steel in structural engineering, by the Corps of Engineers in hydraulics and by two or three private consultants in water distribution system analysis is convincing indication that these electronic machines offer benefits in the same order of magnitude as are being achieved in highway engineering.

For example, in structures it is now possible to feed the computer loadings for a multi-storied building frame and obtain stresses and deflections for purlins, beams, girders, columns and bracing automatically and in a continuous manner. And for water distribution systems, programmed for the Hardy Cross analysis, electronic digital computers can save engineering time and money for other cities as they have for Baltimore and Philadelphia.

HOW THEN are electronic computers to gain widespread use in branches of civil engineering other than highways? The most expensive part of getting into computer operation is working up programs, or sets of instructions, for the computer. Perhaps in actual dollars this is not as costly as computer rental, but at that stage of the work income is bringing some return for the investment. Obviously, one way to bring programming into line is to engage in a cooperative effort, and this has actually been proposed in the highway field where even private users have urged cooperation through a program library to be operated by the Bureau of Public Roads.

The very fact that private highway consultants have urged such a step is indication of the difficulty and expense of programming—for, at least in the past, those who could develop something useful usually held onto it. In the structural field, particularly, American Bridge, which has developed numerous programs in the past seven years, is not likely to give up its well-earned advantage by making its programs generally available.

Nor have the manufacturers of computers been of much help in working up civil engineering computer programs. Although many have expected them to do more, it should be noted that manufacturers are basically purveyors of equipment, not engineering consultants. It is not likely that they will increase programming efforts much beyond their present activity, which is to run programming schools where prospective users can learn the fundamentals of the method.

DESPITE THE DIFFICULTIES facing cooperative effort, there appear, however, to be several broad approaches to licking the programming hurdle confronting smaller firms and agencies. One might be for construction industry organizations and professional societies to finance basic program research in large electronic computer centers maintained by many universities and research agencies. There would still be much to do by the individual user of such generalized programs in making them adaptable to specific needs, but much of the necessary expense could be spread over many.

A second method, probably more adaptable to private enterprise, is for individual companies to be formed, which would specialize in program preparation and data processing. It is understood a number of these, financed largely by interested consulting firms, are in the formative stages. Presumably the cost of program development would be amortized with part of the data processing fee.

A more fanciful approach may be the formation of a national organization of computer users, akin to many other specialist societies now on the scene. Such a society could also recover the cost of program development by charging a proper fee to those using the programs, and could even make the fee large enough to finance still more research and development.

In any event, there is undeniable evidence that the electronic computer, particularly of the digital type, is one of the most significant design tools to become available to the civil engineer in many a year. Some way should be found to speed its wide adoption.

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